MARINE REVIEW.

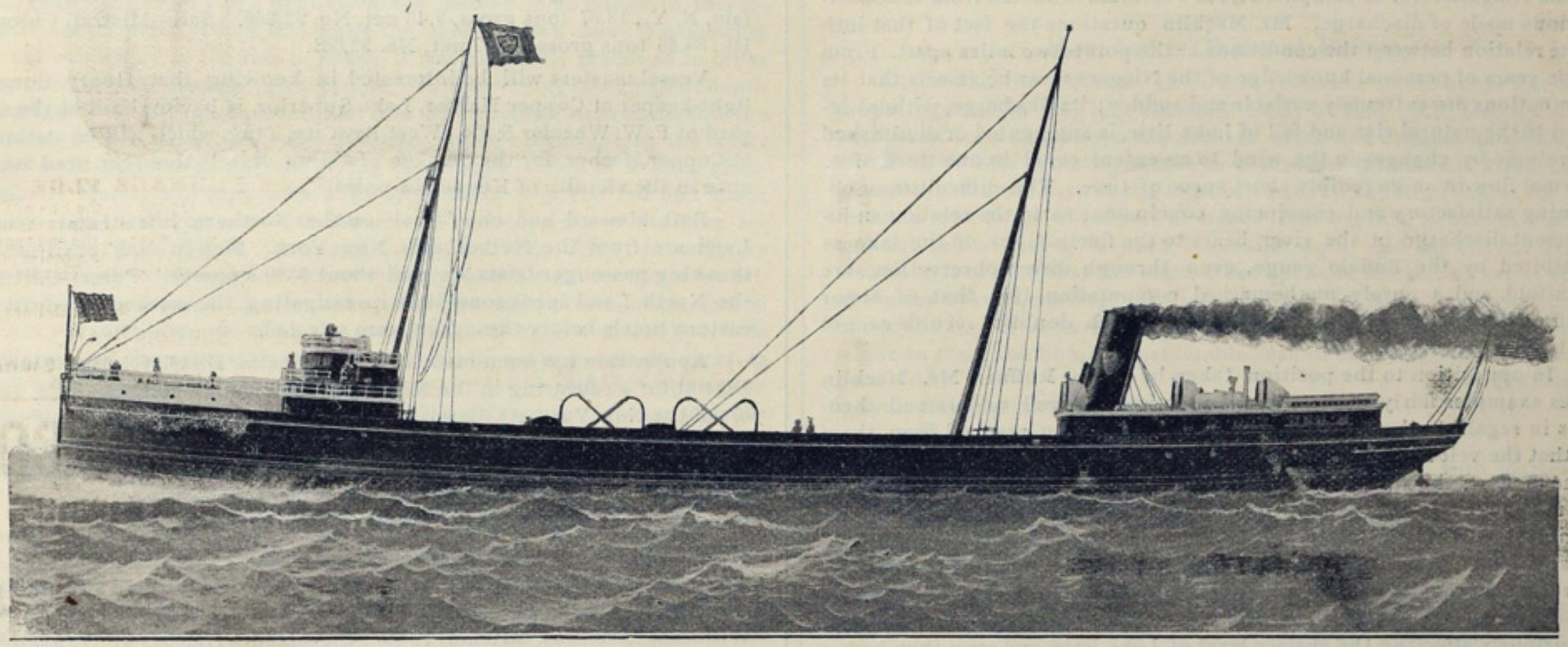
VOL. XI. CLEVELAND, O., JUNE 6, 1895 No. 23.

Marked Improvement in Iron—Prosperous Outlook in Lake Freights.

The iron industry is in better condition to-day than it has been at any time since 1890. This is not an extravagant statement, as the outlook in all branches of the business is indicative of better prices, and an increasing demand against a declining market for full four years past. Iron furnaces that have not been in blast for a long time past have all resumed operations, and the best feature of the ore business, which is nearest the lake trade, is the fact that producers of Bessemers, aside from the Mesabis and less desirable hard ores, have sold practically all ore that they decided to mine when an apportionment of their product was made during the winter. These companies could, of course, increase their output to some extent, but if they should decide to do so, the additional ore would, of necessity, be sold at an increase over the prices that have thus far prevailed, and in any event there is every reason to expect that this year's product in these ores will go into consumption rapidly, and that better prices will be obtained next year.

This general improvement in the iron business has prompted ore shippers to move their product as rapidly as possible, and as a result the lake freight market has been advanced during the past week to figures that are above contract rates—85 cents from Ashland, Duluth and Two Harbors, 75 cents from Marquette and 55 cents from Escanaba. During Monday and Tuesday of the present week, boats to carry nearly 100,000 tons of ore were chartered at 85 cents, the advanced rate from the head of Lake Superior.

It is well to note, however, that ore is being moved at a very rapid rate, the shipments from Lake Superior during May having exceeded by about 100,000 tons, the movement during April and May of last season. Several conditions have combined to cause ore shippers to hurry a movement of their product. Up to this time, cars have been plentiful at Ohio ports, and the ore shippers have been taking advantage of direct shipments to furnaces. Now that the coal mines have resumed operations, the supply of cars will not be so plentiful and there will be more delay at Lake Erie ports, both in providing space on docks for ore and in loading coal. Whether this change in conditions will be an advantage or disadvantage for vessels remains to be seen, but there is encouragement for the vessel interests in the fact that the freight situation has improved constantly since the opening of navigation. Coal shippers have succeeded in covering about 100,000 tons of coal for the head of Lake Superior on contract at 32½ and 35 cents, but few vessel owners are found willing to take coal at these figures.



MENOMINEE TRANSIT COMPANY'S STEAMER NORMAN—LOST IN COLLISION ON LAKE HURON, MAY 30, 1895.

Speed of 21.13 Miles an Hour.

Telegrams from Chicago, Wednesday, to owners of the North West, to the Globe Iron Works Co. and to the REVIEW announced that the big run from Milwaukee to Chicago, made by the big passenger boat on the previous afternoon, with a distinguished party of eastern capitalists and railway officials aboard, had been covered in four hours and six minutes, with a fresh head wind and engines making not to exceed 112 revolutions. The distance is given out as 86½ miles, so that the steamer's speed was 21.13 miles per hour. It is well known that the North West's engines have been working very smoothly since they were overhauled during the winter and there is no doubt of this speed having been attained. During the entire trip from Buffalo to Chicago the boat was ahead of the time schedule fixed for her. It has been the intention to have engines of both of the big boats reach 125 revolutions in actual service, whenever such a speed is required, and it would seem that the North West is gradually being brought up to this point.

Pocahontas Coal for Fuel.

The Northern line passenger steamer North Land fueled with Pocahontas coal in Cleveland for her first trip and the North West took 400 tons of it for her Lake Michigan-Lake Superior trip. It is probable that this coal will be used altogether on these fast passenger steamers. The North West made the run from Detroit to Mackinaw on her trip with the trunk line officials aboard, in an hour and a half less than schedule time, and went from Milwaukee to Chicago in less time by ten minutes than the best previous record for the trip. Chief Engineer Reynolds of the North Land says the absence of smoke with Pocahontas coal is a great advantage and its steaming qualities are excellent. He expects that tests to be made when his boat is in regular service will demonstrate its economical value. This fuel will certainly displace the use of hard coal in steam-yachts on account of its cheapness, and the difference in cost between soft coal may be overcome by its greater heat producing qualities. An inspection of a fire made with this coal under one of the Belleville boilers in the North Land showed a bed of flame that penetrated up among the tubes several feet, with almost an entire absence of smoke. Castner & Curran, Philadelphia, Pa., are general agents for the sale of Pocahontas coal, and the Young & Harrington Coal Co., Euclid avenue, is the Cleveland agency.

June 10 is the date fixed for putting into operation on the Detroit river the marine postal delivery service. A small steamboat, the Trio, which has been in service at Put-in Bay island for several seasons past, has been chartered for the work. She will have a station in the vicinity of Woodward avenue, Detroit, but will be out in the river most of the time. A crew of two pilots, two engineers and three men to handle the mail is thought to be sufficient to care for the service day and night. Arrangements will be made with the telegraph companies to deliver telegrams bearing special delivery stamps. The service for the balance of this season will, of course, be experimental. J. W. Westcott says he has no thought of discontinuing his private agency, which is of such importance that it will be upheld, unless the government service should prove more efficient than is expected.

Little is Expected From the Chicago Commission.

Prof. G. Frederick Wright of Oberlin college contributed an article to the Nation recently, in which he refers to the Chicago drainage canal as the boldest scheme of modern times. His views regarding the effect of the canal on lake levels are quite generally understood. In this late article he says the boldness of the Chicago engineers, and the promptness with which the city is proceeding to carry out their plans, are scarcely less than sublime. He adds that in olden times this project of Chicago might easily have become the occasion of a war between the east and the west, or between Canada and the United States. But Mr. Wright's predictions as to complications that are to arise as a result of the work at Chicago have reference mainly to the distant future and to the visionary talk of an enlargement of the big sewer, so as to admit of the passage of ships between the lakes and the Mississippi. Then, too, all of his arguments are based on the conclusions of Major Ruffner of Buffalo, relative to the Niagara outflow, and it is well known that there are many prominent engineers who do not agree with Major Ruffner on this outflow question.

Among these engineers is Mr. A. J. Macklin, a Canadian member of the American Society of Civil Engineers. In a communication to the Toronto Mail, Mr. Macklin expresses the view that not much information of value will result from the conference of United States engineers at Chicago. The question is extremely complex, he says, on account of the absence of precedents and reliable data on the lake outflow question as a whole. Solution of the question by hydraulic formulæ may only disclose how wide a divergence there is between theory and experiment. He is not at all satisfied with the value of Major Ruffner's observations at the foot of Lake Erie, and does not see that, assuming their correctness, they warrant Major Ruffner's deduction that the withdrawal of 10,000 cubic feet per second at Chicago will lower the level of Lake Erie about 7 inches. The deduction is mainly based upon the relation supposed to exist between the gauge at Buffalo, whose zero is the mean lake level of Lake Erie, and the discharge of the Niagara river as computed from a formula deducted from the observations made of discharge. Mr. Macklin questions the fact of that intimate relation between the conditions at the points two miles apart. From some years of personal knowledge of the Niagara river he asserts that its fluctuations are extremely variable and sudden; its discharge, without regard to the natural rise and fall of Lake Erie, is augmented or diminished in volume by changes in the wind to an extent equal to one-third of its normal flow in an incredibly short space of time. The difficulties of obtaining satisfactory and convincing conclusions as to the relation an increment discharge in the river bears to the fluctuations of the lake as exhibited by the Buffalo gauge, even through direct observation, are manifold, and a purely mathematical computation, like that of Major Ruffner for the level of the lakes, based on such doubtful records cannot be held trustworthy.

In opposition to the position taken by Major Ruffner Mr. Macklin cites examples fairly analogous and practical and well understood theories in regard to the flow of rivers. The conclusion reached from them is that the velocity of a stream increases nearly in proportion to the volume of flow; the surface level, though changing constantly in position from changes in the volume discharged, does not within certain prescribed limits rise or fall in proportion to the augmented or diminished quantities of water. In Mr. Macklin's belief it is possible to draw for the Chicago canal a body of water equal to one-twenty-third of the mean discharge of the Niagara from the vast reservoirs of the lakes without injuriously affecting the surface level of Lake Erie, and even then have a wide margin to work upon for a prospective enlargement of the canal's capacity. At the same time he admits that the question is "one of baffling uncertainty," and intimates that the only way to satisfactorily determine whether the opening of the Chicago drainage canal will affect the level of the lakes is to open the canal and watch the result.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on June 1, 1895:

	Wheat, bushels.	Corn, bushels.
Chicago	18,902,000	5,381,000
Duluth	9,600,000	.....
Milwaukee	283,000	.....
Detroit	401,000	157,000
Toledo	391,000	363,000
Buffalo	1,546,000	531,000
Total	31,123,000	6,432,000

AN ARTISTIC PHOTO OF THE NORTH WEST, HANDSOMELY MOUNTED, SENT TO ANY ADDRESS FOR 50 CENTS, BY THE MARINE REVIEW. MONEY RETURNED IF YOU ARE NOT SATISFIED.

Around the Lakes.

Shipments of hard coal by lake from Buffalo amounted to 259,788 net tons during May.

Ralph Hone, well known marine engineer of Toledo, died at his home in that city a few days ago.

The whaleback steamer Thompson, towing two big barges, all loaded, has of late been making an average of 8⅓ miles an hour.

The American Steel Barge Company has launched at West Superior the second of the oil tank barges building for the Standard Oil Company.

An increase of 50 to 125 tons over first cargoes has, since the Sault canal draft increased a little, been noted in the capacity of the largest boats trading to Lake Superior.

Insurance on the Canadian steamer Jack, which collided with and sank the steel steamer Norman on Lake Huron a few days ago, was placed through Smith, Davis & Co. of Buffalo and amounted to $28,000.

Two steamers of the Lake Superior Iron Co.'s fleet, the La Salle, commanded by Capt. H. M. Stone, and the Wawatam, commanded by Capt. Edward Mooney, made five full round trips between Marquette and Cleveland during the month of May.

Louis C. Wachmuth of Chicago has purchased the steam yacht Sentinel, a boat well known on the Atlantic coast. She is now being brought to the lakes by way of the St. Lawrence. The Sentinel is 125 feet long, has compound engines and is said to be capable of about 15 knots speed.

E. J. Kendall, marine reporter, has been appointed special weather signal agent at Port Huron, and will deliver to all up-bound boats copies of weather reports. If passing vessels desiring the reports should not speak the small boat, a signal of three long and three short blasts will bring the reporter to them.

Vessels resistered in the office of the United States commissioner of navigation during the week ending May 25 are: Steam—Chili, Buffalo, N. Y., 2,584.33 tons gross, 1,845.27 net, No. 127,078; Myron W. Moyer, Buffalo, N. Y., 13.87 tons gross, 9.43 net, No. 92,650. Sail—Mistral, Chicago, Ill., 33.46 tons gross, 31.79 net, No. 92,651.

Vessel masters will be interested in knowing that Henry Corgan, light-keeper at Copper Harbor, Lake Superior, is having built at the ship yard of F. W. Wheeler & Co., West Bay City, a tug, which will be stationed at Copper Harbor, for the purpose of aiding vessels that may need assistance in the vicinity of Keweenaw point.

Both steward and chief cook on the Northern line steamer North Land are from the Netherlands, New York. Men in such positions on these big passenger boats are paid about $300 a month. Purser Curtis of the North Land spent some time investigating the methods of different eastern hotels before these men were selected.

Application has been made to United States District Judge Swan of Detroit for a rehearing in the New York–Conemaugh collision case. Owners of the New York are dissatisfied with the late decision of Judge Swan, in which he reversed his former ruling and declared the New York wholly to blame for the sinking of the Conemaugh. They claim to have new evidence. The application has not as yet been passed upon.

Supplement No. 2 of the 1895 Inland Lloyd's Register, just issued, gives classification particulars regarding eight new vessels. Net tonnage, names of owners, valuations and ratings of these new ships are: Steam—Chili, M. M. Drake and others, Buffalo, 1,845 tons, $150,000, A1; J. J. McWilliams, 2,809 tons, Mitchell & Co., Cleveland, $175,000, A1; Linden, 709 tons, Jenks Ship Building Co., Port Huron, $65,000, A1*; J. Watson Stephenson, 501 tons, Stephenson Transportation Co., Peshtigo, Wis., $60,000, A1*; J. F. Yattaw, 90 tons, Bennett & Haskell, St. Joe, Mich., $8,500, A1½. Sail—Granada, 1,644 tons, James Davidson, West Bay City, Mich., $75,000, A1*; Malta, 2,132 tons, Minnesota Steamship Co., Cleveland, $100,000, A1; Marcia, 2,132 tons, Minnesota Steamship Co., Cleveland, $100,000, A1.

Trade Notes.

The General Electric Co. is equipping the new Eddy-Shaw steamer at Wheeler's yard, West Bay City, with a 150 sixteen-candle-power lighting plant. The order given by Mr. Wheeler assures the owners of this ship that they will have a plant that will be of the same grade of work now put out by this company on all the new cruisers in the navy.

A letter from the Magnolia Metal Co. of New York and Chicago contains a note to the effect that their business in May was the largest of any month during the past two years. As the business of this firm is largely with the mills and manufacturing concerns in all parts of the country, this is one of the best indications of the improvement which has been so long looked for.

The Nickel Plate road has compiled a list of country homes along the south shore of Lake Erie, willing to accommodate summer boarders, and a copy will be mailed to any address by enclosing a stamp to any agent of the Nickel Plate road, or to B. F. Horner, general passenger agent. Aug. 31—265

Commander Mead on Hay Lake Channel Buoys.

Under date of May 31, Friday last, Commander Mead of Detroit, who is the inspector of the light-house district in which Hay lake channel is located, makes answer to complaint from a vessel master in the employ of Pickands, Mather & Co., Cleveland, regarding the buoys of the new channel. The matter was called to the attention of Commander Mead in an official way. The complaint of the vessel master was as follows:

"I find among stakes at the lower end of Hay lake channel that at the entrance to the cut there is a small pole two inches in diameter, with no paint on it, at the upper end on the port side, and the black stake is the same one that was there last season. The ice has scraped all the paint off on the upper side. The stakes below the dike are not placed the same as last season. The second black stake from the lower end of the dike is about 100 feet to the south of where it should be. There should be at least five more pairs of stakes at the lower end of Hay lake above the dike, in what is known as the third section, foot of Hay lake. There is a red can buoy placed at Frechett's point that is not needed, and it should be placed at some turning point."

Referring to the above, Commander Mead says: "This extract contains so many inaccurate statements, that I do not think it could well mislead any one who has a proper knowledge of the conditions existing in Hay lake channel, and I would not deem it worthy of reply had my attention not been expressly called to the matter, and only do so now in order to allay any apprehensions on the part of vessel owners as to the buoyage of the channel. At the lower entrance of Hay lake, where the turn is made from Little Mud lake into the new channel, there are and have been since the opening of navigation two black and one red 25-foot spar buoys to mark the turn, and from thence up to the lower end of the dike there are three pairs of buoys, plainly marking a safe channel. The small pole two inches in diameter with no paint on it may be near one of the larger buoys, and I believe that it is, being one of the markers used last season, but is it not strange that the writer of above quoted letter should have been able to see this and not see spars 6 inches in diameter and extending from 4 to 6 feet above the water? The buoys in this locality are properly placed, and while the second black buoy is somewhat to the southward of the line of buoys, it was purposely placed so in order to afford a wider channel at this point, the water being of sufficient depth to allow of its being so placed, and it is my intention to recommend the moving of red buoys Nos. 4 and 6 further to the northward, as the water is of such depth as to warrant giving vessels the benefit of a wider channel. If vessels will keep within the lines formed by the red and black buoys, they will come into no danger. The buoys above the dike are 3,000 feet apart, but in plain sight, one from the other, in ordinary weather, and, in my opinion, afford every reasonable aid for the safe navigation of the channel. It should be borne in mind that the whole system is not yet complete, and when the ranges and floats are established, it is believed that the navigation of Hay lake will be entirely safe by night as well as by day. Under present conditions, if vessels will only attempt to run when buoys can be seen at a reasonable distance, any master who has a proper knowledge of the channel and currents, will have no trouble in passing through the Hay lake channel."

Racing and Use of Passing Signals.

Editor MARINE REVIEW: Last fall you were kind enough to publish some comments of mine upon the gross indifference of vessel masters on the lakes to the laws with reference to passing signals. At that time, I called your attention to what I had noticed in that respect on a recent trip around the lakes and ventured to predict that unless a more rigid compliance with the law in that particular should be enforced by the government officers, serious accidents were sure to follow.

I now enclose a clipping from the Detroit Tribune of this morning, which tends to emphasize both the truth of my former statement and the imminence of the danger I predicted. The article shows conclusively to my mind, gross negligence on the part of the officers of the Gilbert, the Arundell and the Colonial. (The article refers to a race between the Arundell and the Gilbert on Lake St. Clair, as a result of which a collision with the Colonial is said to have been narrowly avoided. It is also claimed that the Gilbert came near running down the yacht Enright.—Editor.)

If each or either one of these boats had, at the proper time, given the proper passing signal, and insisted upon a proper reply, the dangerous dilemma in which they found themselves placed could not have ocurred. The fact that the Arundell and Gilbert were openly engaged in racing seems bad enough, but that the officers in charge should have permitted themselves to become so engrossed in their racing as not to have noticed the approach of the Colonial, and to have failed to provide for a safe passage by the giving of the proper passing signals, would seem to have been absolutely inexcusable. But what followed was still more culpable. That the officers of the two steamers, one of them loaded with passengers, should have permitted themselves, in the excitement of a race, to entirely overlook the dangerous proximity of a yacht of the size of the Alice Enright, also loaded with passengers, and under full sail, is almost beyond belief. The fact that no accident happened does not relieve the situation. To judge from the clipping, an accident was avoided solely by the good luck and good management of the skipper of the Enright.

I know it will be said that persons who see or are otherwise informed of these violations of the law by those in charge of vessels ought to report them to the proper government officer, giving time and place and volunteering to furnish the testimony necessary to secure the conviction of the offender; and theoretically, perhaps, that may be true, but as a matter of experience, we know that such complaints will not be made, and that if the punishment of the offenders is to depend upon the complaints made and proofs furnished in that way, no one will be punished. A business man, fortunately able to spend his week's vacation in a trip around the lakes, can not be expected to take upon himself the duty of correcting such violations of the law; to make complaints and to subject himself to the annoyance and expense, to say nothing of more unpleasant features, of being called upon to attend examinations and trials for the purpose of furnishing the testimony necessary to convict the offender. And he ought not to be asked so to do. The government makes the law and provides officers whose duty it is to enforce it. If, for any reason, such as failure to furnish sufficient help, to pay sufficient salary, or for any other reason, the government officers can not perform their duty, then, perhaps, they may be excused and the government alone held responsible. But such is not the general understanding. It is generally supposed that the government maintains a sufficient force of inspectors and other officers to adequately enforce the laws, and that the fact that the law is not enforced is proof of the negligence or carelesness of the officers to whom its enforcement is entrusted.

I do not undertake to say who is at fault or where the blame rests, but I do say most emphatically, that the state of affairs shown in my communication of last fall, (and my statement has never been disputed,) and the possibility of such an occurrence as that of yesterday, should not be possible.

E. A. COOLEY.

Bay City, Mich., June 3, 1895.

Hay Lake Channel Buoys.

Editor MARINE REVIEW: In further reference to the buoys not being properly placed in Hay lake channel, it may be said that there are still a number of cans and buoys required to mark the channel properly. It would be of very great assistance to the vessel interests if a red can is placed to mark the turn at the head of the dyke; another can at the turn on Nine-Mile point; three sets of stakes from the turn at Six-Mile point; and two sets of stakes between Nine-Mile point and the curve. It may also be well to note that the black stake opposite the second set of stakes above the dyke is missing. If the buoying of St. Mary's river was placed under the engineers here, who planned the channel and who know exactly where to place the buoys, considerable loss to the vessel interests would be avoided.

T. R. HARVEY.

Sault Ste. Marie, Mich., May 28, 1895.

American engineers, and especially those connected with marine engineering and naval architecture, are always ready to commend the spirit of fairness that prevails throughout the columns of Engineering, the great technical journal of London. In referring to details of official trials of the U. S. S. New York, as taken from the Journal of the American Society of Naval Engineers, the London publication says in its issue of May 17: "We take this occasion of expressing our frequent indebtedness to this journal for much valuable information on the subject of trials made mostly in the United States navy. It is not a very gratifying thing to the people of the foremost maritime country of the world that we should so often have to go abroad for instruction on marine engineering questions."

A notice from the office of Major Ruffner, corps of engineers, U. S. A., Buffalo, N. Y, announces that Niagara Falls has entered the list of lake ports. The third cut is finished in the dredging operations at Connor's island. This gives a channel 50 feet wide at the bottom, and with a full depth of 14 feet at mean lake level, through the bar, and the harbor behind the island is now accessible for craft that do not draw more than 12 feet at mean lake level. Such vessels pass down to the west of Grand island, and on the east of Navy island, around the foot of Grand island, and then round to the port in time to hug closely the buoys marking the new channel on its eastern side. Until the new channel is widened to its full width vessels must go very slowly, and follow the line precisely.

For the National Republican League convention at Cleveland, O., June 18th to 21st, the Nickel Plate road offers one fare for the round trip. June 18—263

For the conference of the Epworth League at Chattanooga, Tenn., June 27th to 30th, the Nickel Plate road offers one fare excursion tickets. June 25—267

Ore and Coal Shipments as Shown by Canal Reports.

Returns of the St. Mary's Falls canal traffic give the first indication of the volume of ore moving from upper lake ports. The canal report shows that although there was no ore moved in April of this year the shipments during May amounted to 1,051,129 net tons, which is 106,162 net tons more than was moved in April and May of last year. The shipments during April, 1894, amounted to 56,501 net tons, and during May 888,466 net tons, or a total of 944,967 net tons to June 1. The coal movement to Lake Superior is indicated by the following:

	To June 1, 1895.	To June 1, 1894.
Anthracite	48,138	79,531
Bituminous	44,038	47,424
Total	92,176	126,955

Shipments of wheat and flour to June 1, this year, are about equal to the movement in these commodities on the same date in 1894. Following is the official report of the traffic to June 1, 1894, and 1895:

COMPARATIVE STATEMENT OF COMMERCE EAST AND WEST BOUND THROUGH ST. MARY'S FALLS CANAL TO JUNE 1, SEASONS OF 1894 AND 1895.

EAST BOUND.

ITEMS.	Designation.	To June 1, 1894.	To June 1, 1895.
Copper	Net tons	17,068	18,892
Corn	Bushels	694,568	.....
Building stone	Net tons	2,563	2,905
Flour	Barrels	1,428,655	1,465,753
Iron ore	Net tons	944,967	1,051,129
Iron, pig	Net tons	4,045	6,983
Lumber	M. ft. b. m.	88,846	87,651
Silver ore	Net tons	372	.....
Wheat	Bushels	4,801,490	4,662,390
Unclassified freight	Net tons	22,054	11,844
Passengers	Number	866	954

WEST BOUND.

ITEMS.	Designation.	To June 1, 1894.	To June 1, 1895.
Coal, anthracite	Net tons	79,531	48,138
Coal, bituminous	Net tons	47,424	44,038
Flour	Barrels	753	150
Grain	Bushels	500	10,250
Manufactured iron	Net tons	3,730	11,128
Salt	Barrels	21,718	59,462
Unclassified freight	Net tons	44,189	45,377
Passengers	Number	834	932

East bound freight, net tons	1,531,704
West bound freight, net tons	158,075
Total	1,689,779

It is hardly necessary to note that the 1895 figures in the above table represent the business of May almost entirely, and that the traffic of the canal during the month just past is the greatest ever recorded. The record for the largest number of boats passing in a single day has been broken several times during the month, as has also the record for the largest registered tonnage. The banner days are as follows: May 16, 99 boats; May 21, 101 boats; May 24, 107 boats; May 25, 102 boats; May 28, 100 boats. The total number of passages for the month was 2,441, an average of seventy-seven per day. The registered tonnage for the month was 2 344,246 tons.

Vessel Property Lost Since Opening of Navigation.

A summary of losses from the opening of navigation to June 1, shows that eleven vessels of an estimated value of $521,000 and 19,105 net tons capacity have been lost beyond recovery. The table makes no reference to cargo losses and includes only such vessels as have probably passed out of existence. Two small boats that were ashore, but have been released within the past week or ten days, the Sakie Shepard and Quickstep, are not included in the list, but the steamer Runnels, which burned at Ashtabula, and which will very probably be rebuilt is included. Of course not all of the lost boats in the list were insured up to the value placed on them, and some of them were not insured at all, but the underwriters have had a number of heavy losses from the stranding of steel vessels. However, it is probable that the estimate of nearly $1,000,000 to be borne by underwriters on the lakes thus far this season is entirely too high. It is safe to say that $250,000 will cover all losses thus far incured by the underwriters on wooden boats and their cargoes, and total losses have been paid on only two steel boats. The table of total losses follows:

VESSELS LOST BEYOND RECOVERY SINCE OPENING OF NAVIGATION, 1895.

Date of Loss.	Name of Vessel.	Cause.	Where Lost.	Cap. Net Tons.	Value.
April 30	Stmr. Everett, A.	Foundered	Lake Huron	1,200	$50,000
May 3	Stmr. Fairbank, N. K.	Fire	Lake Ontario	1,650	30,000
May 4	Stmr. Guide	Fire	Oswego	.....	8,000
May 8	Schr. Kimball, S. H.	Collision	Saginaw Bay	600	5,000
May 10	Stmr. Cayuga	Collision	Straits.	2,600	175,000
May 10	Stmr. Hurd, J. L.	Collision	Straits	950	15,000
May 13	Schr. Kitchen, J. B.	Ashore	Middle Island	550	5,000
May 14	Schr. Kelley, Kate	Foundered	Lake Michigan	650	3,000
May 21	Stmr. New Dominion	Foundered	Georgian Bay	550	7 000
May 29	Stmr. Runnels, J. E.	Fire	Ashtabula	1,100	60,000
May 31	Stmr. Norman	Collission	Lake Huron	255	163,000
				19,105	$521,000

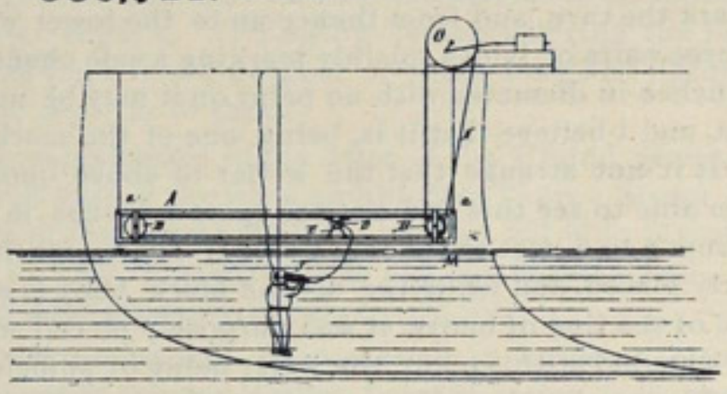
Illustrated Patent Record.

SELECTED ABSTRACTS OF SPECIFICATIONS OF A MARINE NATURE—FROM LATEST PATENT OFFICE REPORTS.

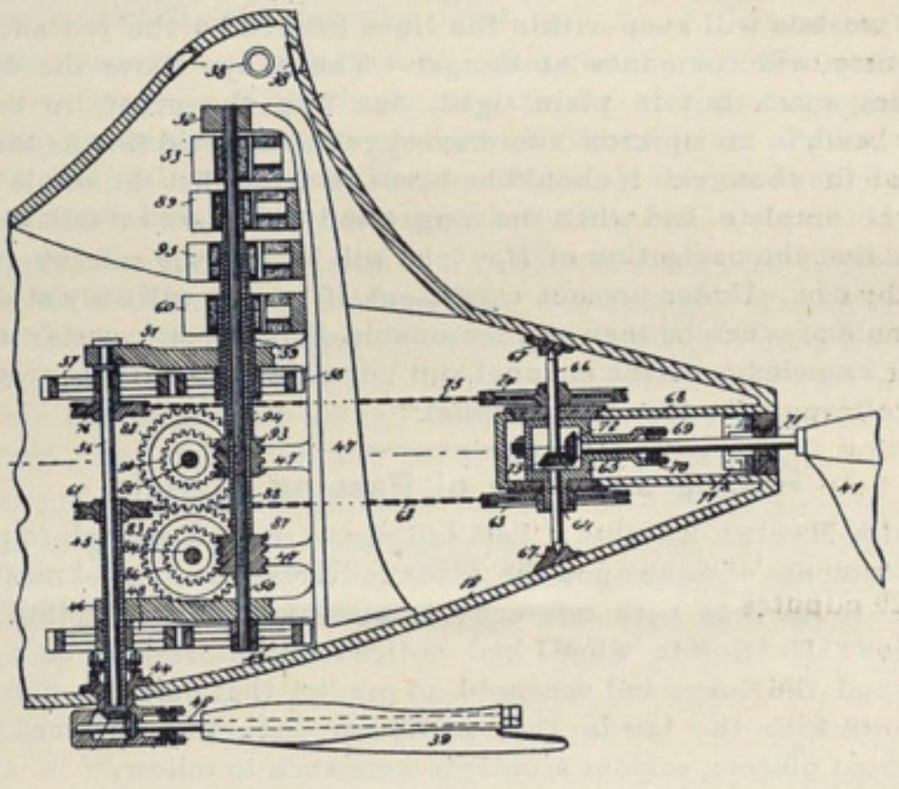
539,911. Apparatus for Cleaning Ships' Bottoms. Albert W. Bryce, New York, N. Y. Filed July 17, 1894. Serial No. 517,791.

Claim. In a device for scraping and cleaning the immersed parts of vessels' hulls, the combination with a frame, of power-transmitting devices, mounted to move lengthwise in said frame, a rotary brush or scraper, and means for operating said brush or scraper from said power-transmitting devices, in the frame.

539,911. APPARATUS FOR CLEANING SHIPS' BOTTOMS.



540,105. STEERING APPARATUS FOR MARINE VESSELS.



540,105. Steering Apparatus for Marine Vessels. Sebestian Lacavalerie, Caracas, Venezuela. Filed Feb. 11, 1895. Serial No. 837,948.

Claim. First, a steering apparatus for marine vessels, comprising the combination of a box projected beyond the vessel and communicating with the interior thereof, said box being capable of revolving in its seat, an exterior shaft revolubly mounted in the box and capable of turning therewith, a rudder fixed to the shaft, and mechanism within the vessel for independently operating the box and shaft. Second, the combination, with the vessel, the rudders on the sides, bottom and end thereof, of the boxes journaled on the vessel to carry the rudders, the shafts secured to the rudders and journaled in the said boxes, a motor geared to the stern and bottom boxes to move them, a second motor geared to the shafts of the stern and bottom rudders to turn them, a third motor geared to the boxes of the side rudders to move them, and a fourth motor geared to the shafts of the side rudders to turn them.

In the May number of the Journal of the American Society of Naval Engineers there is printed in full the paper on "Machinery in British War Ships," which was written by Albert J. Durston, engineer-in-chief of the British navy, and which attracted so much attention when read recently at a meeting of the Institution of Civil Engineers in London.

The Unique's Time.

In our issue of May 23 there were published some figures regarding the speed of the steamer Unique. This was copied on May 27 by the Detroit Free Press, which also added that the figures had been furnished to the REVIEW by the owners of the Unique. Herewith is reprinted a letter from Mr. McElroy to the Free Press, which explains itself:

Editor Detroit Free Press: Without disputing the figures taken from the MARINE REVIEW, which appeared in your article of the 27th on "The Unique's Time," I wish to say that they were not furnished to the REVIEW by the owners of the boat. The current of the river from Port Huron to St. Clair is more than two miles an hour. The Unique is capable of making this run down stream in twenty-eight minutes. The best run made by the Unique up to this date, in my opinion, is eight miles up stream in twenty-six minutes, which is equal to more than twenty miles an hour in still water. In justice to the boat it should be said that she has never yet run even for one minute at full speed. The engine has always been under check. When opened out to full stroke it will, I believe, drive the boat at least two miles an hour faster than she has yet run. C. MCELROY.

St. Clair, Mich., May 20, 1895.

In our last issue Mr. J. W. Westcott of Detroit contributed some remarks regarding this subject, his letter being dated previous to the appearance of Mr. McElroy's letter to the Free Press. Regarding the figures published by the REVIEW, they were furnished by a gentleman who was passenger on the Unique and who writes us as follows:

Editor MARINE REVIEW: I note in the REVIEW of the 30th ult. Mr. Westcott's criticisms of the figures you published as to the time made by the steamer Unique. I have nothing to say as to the distances he gives as the correct ones. I used the figures given to me and which I understand are those commonly used. As to the cutting off of corners, I would say that the Unique followed the regular ship channel, and if there is any corner-cuttting to be done the Greyhound can do it just as well as the Unique the difference in draft being very slight. But let us go over Mr. Westcott's own figures a little.

He says the stretch across Lake St. Clair is 16¾ miles and from Windmill Point to Woodward avenue 6¾, a total less than 23⅛ miles. I make it 23½. Turning to the original figures, the distance is called 25 miles and the time 1 hr, 25 min., 50 sec., or at the rate of 17.47 miles per hour, and not 21 as he states. Using his corrected figures I make the speed 16.42 miles per hour instead of $16\frac{3}{16}$. Mr. Westcott says the Greyhound has done it in less than 1 hour 25 min.; this is better than 16.58 miles per hour. As Mr. Westcott confines his remarks to Lake St. Clair and Detroit river, I will say that I find nothing in the article in question claiming a record for this distance for the Unique except as regards screw boats. We all know that the screw steamer is at a greater disadvantage in shoal water than the side-wheel steamer. But even then I take the liberty of doubting Mr. Westcott's claim that there are fully a dozen steamers in the vicinity of Detroit that can do better. He will doubtless be pleased to name them. As to the Greyhound, I am, and hundreds of others along the river will be, delighted to learn that she is so fast. In view of the constant grumbling of the up-river public at the service given, I wonder at her management so carefully keeping it dark until now. For my own part—and I use the river boats a good deal—I never knew of her doing it, though I have crossed the lake on her many times in one hour 45 min.; which on the authority of one of her officers is her regular time, and I doubt very much her ability to shorten this by over 20 minutes.

However we may be sure of one thing—Detroit boats will never be beaten (on paper). They are all flyers till they are beaten or sold. I wait with interest Mr. Westcott's list, and meanwhile I shall remain

A PASSENGER,

Marine City, Mich., June 1, 1895.

Tubulous Boilers in the French Navy.

In the current number of the Journal of the American Society of Naval Engineers, Assistant Engineer John K. Robison, U. S. N., writes of his observation of the practical working of tubulous boilers in France, and gives such data as could be obtained regarding the most important of the boilers.

"In nearly every vessel under construction for the French navy," he says, "boilers are of the tubulous type, and cylindrical boilers have almost entirely disappeared from designs for men-of-war in favor of the lighter tubulous ones. For torpedo boats and other vessels of small size, the boilers are generally of the Thornycroft or Normand type, and, except for slight differences in detail, are similar to those used in this country. There are only three types which can be said to have any chance of replacing the Scotch boiler—the Belleville, the D'Allest and the Niclausse. Other types essay to fill the places of these boilers, but, so far as I know, the three named are the only types that are used in vessels larger than gunboats.

"The Belleville is too well known to require description, but some consideration of its working may not be out of place, when it is considered that the results are those reached where the experience has been greater than ours. The extremely small quantity of water in the boiler has made the use of an automatic feed regulator necessary. This regulator works well when it does work, but fails to work at all often enough to destroy all confidence in it. Besides when the regulator fails to work, serious accidents often result. The amount of feed water is so small that any failure of the regulator to act is liable to cause the water to disappear entirely from the boiler. The small quantity of water in the boiler likewise causes large variations in the steam pressure and necessitates a larger pressure in the boiler than at the engines; that is to say, there is a reducing valve between the boilers and the engines. The slow circulation of the water causes the tubes to deteriorate very rapidly if the water is not pure. The tubes of the lowest row are made very thick, but they wear out very rapidly nevertheless, being bent after the fires are lighted under the boilers two or three times. The system of circulation of the water causes a great deal of 'priming,' and this can not be cured even with the use of a complicated set of baffle plates in the steam drum of the boiler, and with the addition of a separator between the boilers and the reducing valve. The reducing valve must also reduce the amount of water in the steam, though, as has been seen, this is not the prime object of its use. It has been estimated by engineers that have worked these boilers for several years that the amount of water in the steam at the cylinders is never less than 10 per cent.

"The use of the Belleville boilers was said at the outset to be sure to give a great gain in economy of fuel. In fact, many engineers still seem to think that they are not greatly inferior to the Scotch boilers in this respect. The fact is, however, that the arrangement for the combustion of the coal to take place entirely in one place has made the mixing of the gases of combustion very poor. To ensure their proper mixing all the gas from the grate should be brought together at some point before the combustion is supposed to be completed. This would correct the inequalities in the thickness of the fires in different parts of the grate. So very poor is the mixing of the gases in the Belleville boiler, that it has been found necessary to have a pump for forcing jets of compressed air in the top of the furnace, forcing the gases of combustion down towards the grate, and so promoting their thorough mixing. The absolute necessity of a sure acting feed pump has led to the use of a specially designed pump that will always be sure to act. This result is obtained at the cost of a large amount of steam for the pumps, but the result is so necessary that it has been said that the pump is what makes the boilers.

"The accessories to this boiler are so numerous that they make a considerable addition to the machinery of a vessel. The number of separate machines that are required to make this boiler act in at all a safe way leads to an exaggerated amount of repairs, and the care of the steam producing plant becomes a more difficult matter than that of the engines The repairs to the boilers are more costly than those for ordinary boilers. Not that any one case of repairs is not cheaper than a similar job would be with Scotch boilers, but the greater number of repairs has led to greater expenses for the government in the repair shops. The repairs can, however, be made in a much shorter time than with the cylindrical boilers, and this must be held to counterbalance in a large degree, the greater frequency of break-downs in the boilers. Also the large number of boilers in the steam producing plant of a powerful ship makes the loss due to the putting out of commission of any one boiler a minimum. It is also to be noted that all ships that are fitted with these boilers have more boilers than are necessary to the running of the engines at full power. Thus it is always possible to run at full power even with one or more boilers disabled. The advantages of the Belleville boiler over the Scotch boiler that are the most appreciated in France are the great gain on the weight of the steam producing plant, even with a reduction in the forcing of the boilers, and the ease of raising steam. The pressure allowed for this boiler is practically unlimited by the boiler, on account of the small diameter of the cylinders that contain the steam. The parts are small and can easily be removed from the boiler rooms without cutting any holes in the decks. In fact, the whole boiler may be removed from the boiler room without troubling the decks at all. While Mr. Belleville has been constantly at work devising methods for making his boilers run with success, other people have been busy devising some way of getting around the difficulties in the Belleville boilers by a change in the system."

In all lake charts for navigators to be prepared by the hydrographic office, navy department, a system of indicating depths of water by the use of different shades of blue will be inaugurated. As in actual practice the water which shows the greatest discoloration is usually the shallowest, so on these charts the deepest shades of blue indicate the least depth, while the lighter shades are used to indicate greater and safer depths. By inspection of the first chart issued by the hydrographic office, that of the Detroit river below the city of Detroit, it will be seen that the white or untinted portion indicates 18 feet or more, light blue 18 feet to 12 feet, medium blue 12 feet to 6 feet, and dark blue under 6 feet.

MARINE REVIEW

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department contain the names of 3,341 vessels, of 1,227,400.72 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons and over that amount on the lakes on June 30, 1894, was 359 and their aggregate gross tonnage 634,467.84; the number of vessels of this class owned in all other parts of the country on the same date was 316 and their tonnage 642,642.50, so that half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1894, was as follows:

Class.	Number.	Gross Tonnage.
Steam vessels	1,731	843,239.65
Sailing vessels	1,139	302,985.31
Canal boats	386	41,961.25
Barges	85	39,214.51
Total	3,341	1,227,400.72

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
Year ending June 30, 1890	218	108,515.00
" " " 1891	204	111,856.45
" " " 1892	169	45,168.98
" " " 1893	175	99,271.24
" " " 1894	106	41,984.61
Total	872	406,976.28

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

(From Official Reports of Canal Officers.)

	St. Mary's Falls Canal.			SuezCanal.		
	1894.	1893.	1892.	1894.	1893.	1892.
No. vessel pass'ges	14,491	12,008	12,580	3,352	3,341	3,559
T'n'ge, net registd	13,110,366	9,849,754	10,647,203	8,039,106	7,659,068	7,712,028
Days of Navigat'n	234	219	223	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

GENERAL POE of the army engineer corps, who has been in charge of the principal river and harbor improvements on the lakes, makes but one answer to all theories as to the cause of the present low stage of water. He simply defends the opinion that the difficulty is due almost entirely to light rainfall throughout the lake region for some time past. In answer to the claim that the deepening of the Lime-Kiln crossing is responsible for low water in the rivers, he is quoted as referring to the fact that in 1839 the lakes showed what is considered the standard high water mark, and which is always used as a basis in computing high water levels. The stage of water that year was 5½ feet higher than in the year 1847, when it fell to the low water mark. The water in the latter year was about 10 inches lower than it is to-day. How, he asks, is this to be accounted for except by the natural law of precipitation and evaporation? "Give us the rainfall of three years ago," he says "when we had three days of dry weather in May and five days in June, and the level of water will go up a foot or two and all complaints and theories will cease. If the level in Detroit river, St. Clair river, Lake St. Clair and Lake Huron is lowered by the deep channel at the mouth of the river, why do not the levels in Lake Erie and all its harbors show a corresponding increase?"

IT CAN NOT be said that the new regulations contained in the White law are in any way responsible for the unusual number of collisions that have occurred since the opening of navigation. The claim of one captain who is quoted as saying that the "new law would not permit of his blowing a cross signal" amounts to nothing, as it is well understood that cross signals were never permitted. Vessel masters understand, of course, that the only important change in the new law having reference to signals is the rule making three whistles a fog signal for all steam vessels, whether having tows or not, and the object of this change was to distinguish between the porting signal and the old signal of one long whistle in fog for a steamer without a tow.

THURSDAY, June 13, is the date fixed for official ceremony in connection with the opening of the Canadian canal at Sault Ste. Marie. It is to be hoped that the canal will actually be in readiness for free passage of vessels after that date. There is much of the canal work yet to be done, but this will not, of course, interfere with the ceremony and may not delay the opening of the canal for business. The celebration on the 13th inst. will be attended by leading officials of the dominion government, as well as members of parliament, who will go from Ottawa to Sault Ste. Marie on a special train. The final cost of the canal will be considerably over $4,000,000.

ONE of the best features of the present outlook in the iron industry is the fact that owners of Lake Superior mines producing standard Bessemer ores have already sold about all the ore that it is possible for them to produce this year and have every reason to expect that next year's prices will be 50 cents or more a ton higher than the figures at which this year's product has been sold. In fact, the feeling in this regard is so strong that there is little disposition among companies mining the best ore to make any attempt to increase their product this year.

New Charts of Detroit River, Lake Huron and Georgian Bay.

As a result of the survey made last summer by officers of the U. S. S. Michigan, the hydrographic office, navy department, has just issued a preliminary chart of Detroit river from Bar point to Mamajuda lighthouse, with an enlarged plan of the Lime-kiln crossing and vicinity. Although the hydrographic office has published two pilot charts, or rather maps of the entire chain of lakes, this is the first sectional chart of detail gotten out by the navy department and intended to be carried aboard ship and used by vessel masters as they now use the numerous charts of the lakes prepared by the army engineer corps. It is a navigator's chart. The publication of this chart is the beginning of a duplication by the navy of work of this kind now conducted by army officers, but laying aside the right or wrong of this duplication of service by two departments of the government, it may be said to the credit of the hydrographic office that there has been little delay in presenting to lake interests the data obtained from this first survey by the Michigan.

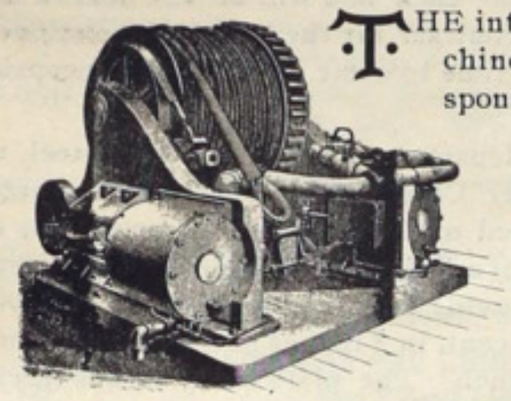
A few vessel men who have seen the new Detroit river chart have expressed the opinion that it would be far more serviceable if made on a larger scale, but in answer to this Commander Sigsbee of the hydrographic office says it is only a preliminary photo-lithographic production, gotten out for the purpose of publishing the data as soon as possible. The final chart will be a very finished production on copper on a somewhat larger scale than the one now issued. In a few days the hydrographic office will issue a general chart of Lake Huron and Georgian Bay, which Commander Sigsbee says will exemplify very fairly what he thinks is a good sample of a navigator's chart. The price of the Detroit river chart is 30 cents. Copies of any of the publications of the hydrographic office may be had from the MARINE REVIEW.

The United States Standard Register of Shipping is a large volume containing rules for the construction of steel, composite and wooden vessels, as well as a list of nearly all steel vessels in the United States, with tonnage, dimensions, names of owners, etc. A very large percentage of steel vessels built on the lakes during the past six or eight years have been classed under the direct supervision of the society publishing this register, and the book contains particulars of all steel vessels on the lakes, whether classed by the society or not. It is also a valuable book of reference for manufacturers of ship plate, beams and other material entering into the construction of steel vessels, as specifications for material are often based on the rules which it contains. Although this register has in the past been sold strictly on subscription, arrangements have been made by the REVIEW whereby a copy of it will be forwarded to any address for $10.

The Babcock & Wilcox Co., manufacturers of the steamer Unique's water tube boilers, are now thoroughly examining and overhauling the boiler in which a defective tube caused a very unfortunate accident, and the boat will be in commission again shortly. If it were not for the loss of life resulting from the accident, there would be little to regret in connection with it, as the manufacturers are among the best known and most responsible firms of the country. Owners of the boat have a guarantee from the Babcock & Wilcox Co., and the accident was one of an unavoidable kind in detail of construction that will not result to the disadvantage of the boat or the boiler manufacturers among engineers and other marine men who understand the circumstances. It is well known that the Babcock & Wilcox Co., having gone into the manufacture of marine water tube boilers, is as certain of success eventually in such an undertaking as any concern known to the business.

The Nickel Plate road has published a map of Boston, Mass, showing the location of the Christian Endeavor convention hall and state headquarters of the 14th international convention, July 10th to 15th, and presenting the merits of the company's through drawing room sleeping car line between Chicago and Boston. Write for a copy to any agent of the Nickel Plate road, or B. F. Horner, general passenger agent. July 5—266

Steam Towing Machines on the Lakes.



THE introduction of the steam towing machine in the lake trade has come in response to a demand for the most economical operation of steamers and tow barges, and safety and dispatch are included in this new departure in handling tow barges. One of the machines has been in operation several seasons on the Aurora, owned by James Corrigan. This season it has been adopted by the most conservative as well as the largest concern in lake transportation, through being placed on the Marcia and Malta, the two steel tow barges recently put into service by the Minnesota Steamship Co.

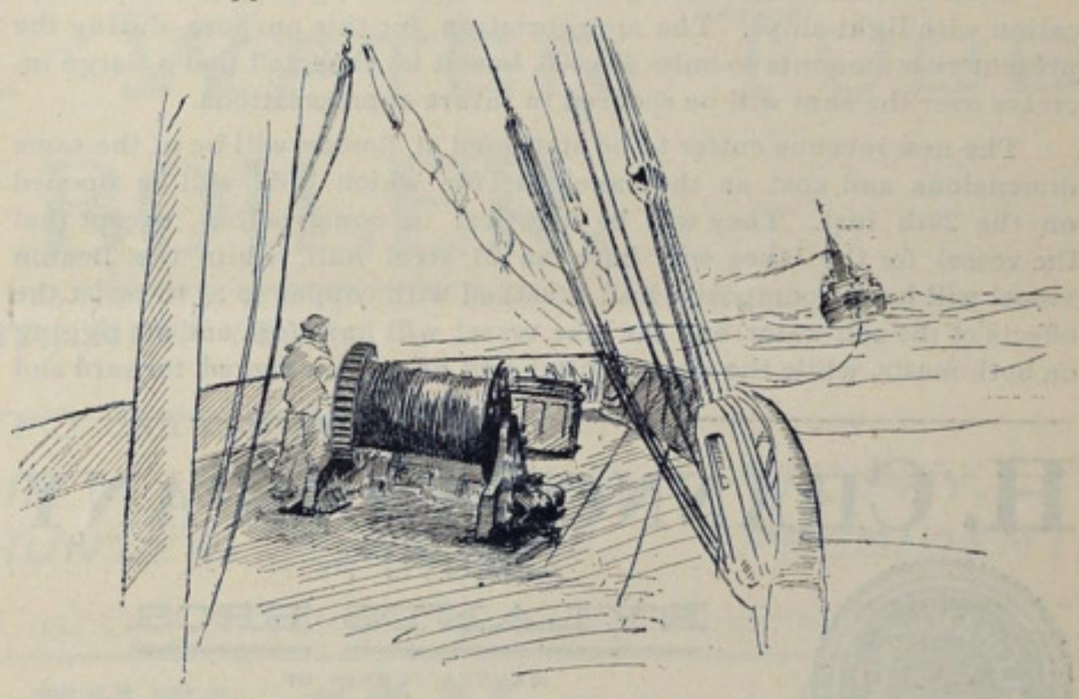
Mr. H. G. Dalton has the following to say of the machines on these barges: "As far as we have gone, our people speak in the highest praise of them, and I have no doubt they are going to prove a good thing, and will be generally adopted as soon as they become well known. We have had a great many people aboard looking at them, and they all seem very much pleased with the machines."

If lake vessel owners will take their pencils and figure the difference in the first cost of a steamer and a tow barge, and then figure how much a tow barge will carry and how much less it costs to operate them, and then consider the safety, economy and despatch obtained in using these towing machines, which still further require less men for handling the tow line, and minify the chances of collission in narrow channels and the loss of the barges in heavy weather, there would be some inquiry as to the particulars and cost of these machines, and owners who have no barges would begin to figure with ship builders. It can be shown that the machines pay for themselves in a short time. The building of steel barges by the Minnesota Steamship Company was not an experiment. They had full information as to the earning ability of tow barges, through actual experience, and then they adopted the most economical means of towing or handling them.

Another conservative man who has made money at all times in the lake trade is Capt. James Davidson. The two wooden steamers which will leave his ship yard soon will be equipped with these machines, and the car transfer barges will also be equipped with the same device. Within a month or two there will be seven of these Shaw & Spiegel steam towing machines in daily service on the lakes. It requires some time to build them and parties interested would do well to write the patentees and builders, the American Ship Windlass Company, Providence, R. I., at once. Three are being built for service on the coast.

Following is a list of windlasses and other ship machinery recently built and building by the American Ship Windlass Co., Providence, R. I

1 No. 3 new style steam capstan windlass, 1 No. E crank steam capstan and 1 steam towing machine for each of the Minnesota Steam Ship Company's steel barges Malta and Marcia.
2 Naval capstans for St. Mary's Falls canal.
1 No. 6 new style steam capstan windlass and 1 No. E steam capstan for steamer John J. McWilliams, built at West Bay City, Mich.
1 No. 7 new style steam capstan windlass and 1 No. D steam capstan for steamer Chili, built at Cleveland, O.
1 No. 4 new style steam capstan windlass for steamer Argo, built at Detroit, Mich., also 1 No. E hand capstan.
1 No. 4 new style steam capstan windlass and 1 No. D hand capstan for steamer I. Watson Stephenson, building at West Bay City, Mich.
1 No. 5 new style steam capstan windlass and No. E steam capstan for steamer John B. Trevor, building by the American Steel Barge Company.
1 Tug boat windlass and 1 14-inch steam gypsey for tug Zenith, Duluth, Minn.
1 No. 5 hand capstan windlass for steamer V. H. Ketcham, on the lakes.
1 Steam capstan windlass for tug at Duluth, Minn.
1 No. 3 steam capstan windlass for steamer building at Mt. Clemens, Mich.
1 No. 7 new style steam capstan windlass, for towing schooner building by Capt. James Davidson.
2 No. 7 new style steam capstan windlasses, 2 No E steam capstan and 2 steam towing machines for steamers building by Capt. James Davidson.
2 No. 5 new style steam capstan windlasses and two steam towing machines for car transfer barges, building by Capt. James Davidson.
1 No. 4 new style steam capstan windlass for steamer building by Abram Smith & Son.
1 No. 7 new style steam capstan windlass and 1 No. E steam capstan for steamer No. 108, building by F. W. Wheeler & Co.
1 No. 6 new style steam capstan windlass and 1 No. E steam capstan for steamer building by the Chicago Ship Building Company.
2 No. 7 steam capstan windlasses and 2 No. E steam capstans for steamers Victory and Zenith City, building by the Chicago Ship Building Company.
2 No. 4 new style steam capstan windlasses and 2 No. D crank capstans for barges Nos. 75 and 76 building by the American Steel Barge Company, for the Standard Oil Company.
1 No. 4 new style steam capstan windlass for steamer A. Folsom, Bay City, Mich.
1 No. 4 steam vertical yacht windlass for yacht Wapiti at West Bay City.
1 18-inch steam gypsey for tug Eleanor L. Wright, Boston
1 No. 000 yacht crank capstan for yacht Nada.
3 No. C double barrel steam capstans for United States engineers, Missouri river.
1 No. B steam capstan for Tide Coal Company.
1 No. A steam capstan for steamer Eillen, Fulton, Ill.
1 No. B steam capstan for United States steamer Leota, Lincoln, Ala.
1 No. 7 new style steam capstan windlass for steam ship New York, and 1 No. D steam capstan for same.
1 No. C double barrel steam capstan for tug Wm. J. Keyser, Pensacola, Fla.
1 New style steam pump brake yacht windlass for yacht Almy.
3 Naval steam capstan windlasses, 2 wire rope windlasses, 2 wire cable nippers and 3 pair of Emery and Cheney patent elastic chain stoppers for the gunboats building at Newport News, Va.
1 No. 4 steam yacht windlass for yacht Admiral.
1 No. E double barrel steam capstan for dredge Charles Fobes, Mobile, Ala.
1 No 2 new style pump brake yacht windlass for yacht Harriet.
1 No. 6 vertical steam yacht windlass for tug Albert F. Dewey.
1 No. 2 new style steam pump brake yacht windlass for dredging steamer Cape Fear for United States engineers; also 2 Emery & Cheney chain stoppers.



1 No. 3 new style steam capstan windlass for steamer Newport News, Newport News, Va.
1 No. A steam capstan for steamer Hattie Darling, Moline, Ill.
1 No. 7 new style steam pump brake yacht windlass for barge Graham's Polly.
1 No. A dock steam capstan for tug Margaret J. Sanford, Jersey City.
1 No. 000 bronze yacht crank capstan for yacht Annie L.
1 No. 3 pump brake yacht windlass for yacht building at East Boston.
1 Steam towing machine for steam collier Lebanon, of the Philadelphia & Reading Railroad Company.
1 No. 2 hand pump brake windlass for schooner Lewis Jane, New London, Conn.
1 No. 2 hand pump brake windlass for schooner Maria, Stony Point, N.Y.
1 No. E steam capstan for dredge at Jersey City.
1 New style steam pump brake windlass for the Pigeon Hill Granite Company, for stone sloop.
1 No. 8 new style steam capstan windlass, 1895 pattern, for steamer building by the Wm. Cramp & Sons, Ship & Engine Building Company, for William P. Clyde & Co. and 1 No. E steam capstan for same.
1 No. 6 new style steam pump brake yacht windlass for yacht No. 284, building by the Wm. Cramp & Sons Company.
1 No. 2 new style pump brake windlass for the Morgan Iron Works, New London, Conn.
1 No. 2 hand pump brake windlass for tug Portsmouth, Norfolk, Va.
1 No. 3 pump brake yacht windlass for yacht building at Wilmington, Del.
1 Bronze yacht windlass for yacht building at Elizabeth, N. J.
1 No. 7 new style pump brake yacht windlass for tug at Jersey City.
6 No. 000 bronze yacht crank capstans and 4 No. 000 galvanized yacht crank capstans have been sold for yachts building in different parts of Great Britain.

1 Pump brake attachment for wood windlass, Mobile, Ala.
1 No. 3 new style pump brake yacht windlass for yacht Aquila.
1 No. 7 new style steam pump brake yacht windlass for pilot boat John H. Estill, Savannah, Ga.

In addition to the above orders the American Ship Windlass Company has sold over one hundred and seventy-five hand capstans, over one hundred and ten gypsey windlasses, besides winches of different kinds, chain stoppers, wharf drop gearings, etc, reaching the following points: Boston, Nantasket, Quincy Point, Fall River, Narragansett Pier, New London, Gildersleeve, Conn., New York, Brooklyn, Rondout, N. Y., Greenport, N. Y., Nyack, N. Y., Elizabeth, N. J., Philadelphia, Wilmington, Del., Baltimore, Sparrow's Point, Md., Newport News, Exmore and Cape Charles, Va., Charleston and Port Royal, S. C., Dublin and Thomson, Ga., Pensacola, Milton and Port Tampa, Fla., Mobile, New Orleans, St. Louis, Keokuk, Louisville, Cincinnati, Pittsburgh, Buffalo, Detroit, West Bay City, Chicago, Fountain City, Wis., St. Paul, San Francisco, Oakville, Montreal and Toronto, Canada, Belize, Central America, Trinidad, Bermuda, Great Britain and Odense, Denmark.

In General.

A striking feature of the June Review of Reviews is the great number of portraits of men of the day.

Now that J. J. Hill of Great Northern railway fame is connected with the Northern Pacific, it is said that he will have built on the Clyde five steamers that will be registered in China and operated on a trans-pacific line from Seattle.

Some twenty years ago Harland & Wolff, well known ship builders of Belfast, built the White Star line steamship Germanic. The boat, which was overhauled recently, has been in service ever since and has run over 1,500,000 statute miles.

Great Britain is continuing the work of effecting electrical communication with light-ships. The appropriation for this purpose during the present year amounts to only $55,000, but it is expected that a large increase over the sum will be secured in future appropriations.

The new revenue cutter to be stationed at Boston will be of the same dimensions and cost as the lake boat for which bids will be opened on the 20th inst. They will be identical in construction, except that the vessel for the lakes will have an all steel hull, while the Boston vessel will have a composite hull sheathed with copper so as to resist the effects of the salt water, and the lake vessel will have fore and aft rigging on both masts, while the ocean cutter will be square rigged forward and will spread enough canvas to cruise independently of her engines if necessary. The boats will cost $175,000 each and will be the best in the service. It is not probable that the contract for the boat to be stationed at San Francisco will be let for some time to come, as the full appropriation has not as yet been obtained.

In trying to make, for the navy department, plates of nickel steel, to be used in new boilers for the cruiser Chicago, the Carnegie company rolled eight plates but all were rejected on three different inspections as not coming up to specifications. On a fourth test, one plate is said to have met the specifications, which provide for a tensile strength of 80,000 pounds, elongation of at least 25 per cent. in 8 inches and an elastic limit of at least 50,000 pounds per square inch. The plate is 1⅓ inches thick. The Carnegie company is to get 5¼ cents a pound for it, if they meet the specifications. It is to be hoped the steel company will meet the requirements on all of the plates, as it is certain that should it be conclusively proven that nickel steel can be successfully used in the manufacture of boilers, and can be furnished at a reasonable figure, it will mean a very large consumption of this class of material.

TO IRON MANUFACTURERS. OFFICE of U. S. Light-House Engineer, Eleventh District, Detroit, Mich., May 31, 1895. Sealed Proposals will be received at this office until 3 o'clock P. M. of Wednesday, the 26th day of June, 1895, for furnishing the materials and labor of all kinds necessary for the completion and delivery of the metal work for the Round Island Light Station, Straits of Mackinac, Michigan. Plans, specifications, forms of proposal, and other information, may be obtained on application to this office. The right is reserved to reject any or all bids, and to waive any defects. M. B. ADAMS, Major, Corps of Engineers, U. S. A., Lighthouse Engineer. June 13

TO BUILDERS. OFFICE OF LIGHT-House Engineer, Eleventh District, Detroit, Mich., May 31, 1895. Proposals will be received at this office until 3 P. M. of Wednesday, the 26th day of June, 1895, for furnishing the materials and labor of all kinds necessary for the construction, erection and delivery of the Round Island Light Station, Straits of Mackinac, Michigan. Plans, specifications, forms of proposal, and other information may be obtained on application to this office. The right is reserved to reject any or all bids, and to waive any defects. M. B. ADAMS, Major, Corps of Engineers, U. S. A., Light-House Engineer. June 13

H. CHANNON COMPANY

AGENTS FOR

RYLANDS BROS.

MANUFACTURERS OF

ENGLISH GALVANIZED STEEL HAWSERS.

24-26 Market Street, CHICAGO, ILL.

To Vessel Owners and Captains

Look out for **Graham's Coal Dock,** *foot of 21st St., Detroit.*
100 Tons, *best quality, on hand all the time* **Fresh on Cars.**
You can get it from **Chutes, High Platform or Deck.**
Chutes fit highest or lowest boats, and can give as quick dispatch as at any dock. Widest point on the river, and nothing to interfere in rounding to with tows.
No Car Boats, Ferry Boats or Elevators in the way.
Ten Minutes Ride to City Hall. *Supplies right at hand.*

TELEPHONE 2083. OR WRITE

JAMES GRAHAM, DETROIT, MICH.

AMERICAN SHIP WINDLASS CO. P. O. BOX 53, PROVIDENCE, R. I.

BUILDERS OF THE

"Providence" Windlasses and Capstans

350 STYLES AND SIZES.
OVER 5000 IN USE.

SEND FOR CATALOGUE.

FRANK S. MANTON, AGENT.

Don't You Believe It?

If you don't, give us a chance to prove that we can coal your boats with quick dispatch, and with most satisfactory fuel.

We have Four Large CHUTES on our Docks at AMHERSTBURG, ONTARIO, 1,000 FEET RIVER FRONT and Day and Night Force.

OUR STOCK CONSISTS OF

"Keystone" Massillon, Youghiogheny, and Best Grades of Hocking Koals.

O. W. SHIPMAN, MAIN OFFICE, 90 Griswold St., **Detroit, Mich.**

The Marine Manufacturing & Supply Co. 158 South St., NEW YORK.

Manufacturers and dealers in Ship Machinery, Windlasses, Capstans, Winches, Pumps, Brass Work, "Monitor" Side and Deck Lights, Cannon, Rails, Stanchions.

Ship Chandlery and Engineers Supplies, Cordage, Oakum, Wire Rope, Anchors, Chain, FLAGS AND SIGNALS, Hose, Packing, Oils, Waste, etc., etc.

Estimates furnished for complete outfits for vessels.

GRAHAM-MEYER TORCH and LIQUID LIGHT COMPANY

89 Fulton St.. Boston, Mass.

MANUFACTURERS OF

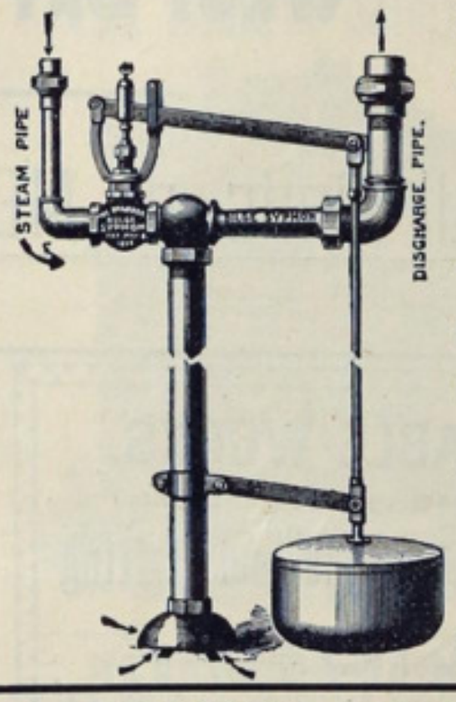
Torches and Liquids for Lights of Various Colors,

For Signal Lights and Illuminations of all kinds.
Blue Flash Lights a Specialy.

We call the attention of masters of vessels to the efficiency of our patented flare-up or flash light torch. It can be used with kerosene or spirits of turpentine. Its superiority over all other kinds of torches is that it is indestructible. Being filled with asbestos, it will last for years, and is ready for use at any moment. It gives a white flame three to five feet high, burns less liquid than any ordinary torch of the samc size or larger. The combustion is so perfect that very little smoke is made, and the flame is therefore much brighter. At night you can wigwag with this torch. Rain or spray will not extinguish it, and the stronger the wind the better it burns. We have also a **Blue, Green and Red Burning Liquid,** to make any code of signals required. Yachtsmen will find this of immense value for signaling.

Lake Agents: { **The Upson-Walton Co., Cleveland, O.**
H. Channon Co., Chicago, Ill.

THE BRAENDER AUTOMATIC BILGE SYPHON,



Always on Watch,

"SHIP AHOY."

It never tires, or goes to sleep, and is reliable at all times.

It is the best, cheapest and surest way of keeping your vessel dry.

They are indorsed by leading Engineers throughout the country.

They commend themselves wherever placed.

A dry bottom in ship's holds gains speed, which is equal to money.

By giving it a trial, it will speak for itself.

Write for circular,

PHILIP BRAENDER,
261 West 118th Street, • NEW YORK.

THE BABCOCK & WILCOX CO.

FORGED STEEL WATER-TUBE MARINE BOILER,

29 CORTLANDT ST., NEW YORK.

BOILERS SOLD TO STEAMERS

NERO,	*ALGERIE,*	*ELEANOR,*	*REVERIE,*	*TROPHY,*
UNIQUE,	*HERO,*	*H. M. S. HUNTER,*	*SENECA,*	*PRESIDENT.*

Under construction :—Two steamships for Dominion Coal Co.; One steamship, Chicago Shipbuilding Co.

The Vanduzen Steam Jet Pumps

Are the Cheapest and Most Reliable Pumps in the world. Cannot get out of order, nor freeze up, nor clog.

The Most Effective, Reliable and Durable.

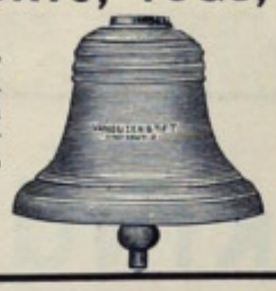
Cost only from $7.00 up to $75.00. Capacity from 250 to 12,000 gallons per hour. ☞For STEAMBOATS, BARGES and VESSELS of Every Description. ☞Price, Catalogue, etc., Sent Free.

We are also founders of the Highest Grade, Finest Quality

BELLS FOR STEAMBOATS, TUGS,

Barges, Ferry Boats, Sailing Vessels, etc.

Our Bells are of approved workmanship, and of the BEST MATERIAL, and of full, clear tone, and will always pass Government inspection, as every Bell is reliable and first-class. We can supply them in Plain Finish or Highly Polished, and with or without Fancy Hangings. Price and Terms furnished free. Address,



The Buckeye Bell Foundry,
The E. W. Vanduzen Co., Prop's. CINCINNATI, OHIO.

FUEL COAL ....AT BUFFALO.

Vessels Supplied with best Youghiougheny Pittsburg or Fairmount Coal at Lehigh Valley Docks or by Barge, at market prices.

We are independent Coal Dealers and have no connection in Fueling business, directly or indirectly, with any Coal shippers by lake.

HOWARD & CO.,
Telephone 1381 15 White Building, BUFFALO, N.Y.

O. S. Richardson Fueling Co., ✱ ✱ O. S. Richardson & Co.

COAL **Office, 225 Dearborn St., CHICAGO, ILL.** COAL

Fueling Docks

Foot No. Market Street.
18th Street Bridge.
Illinois Central Slip "C."

Location of Fueling Docks indicated on the accompanying map by ✱

TELEPHONE MAIN 1845.

Anthracite Receiving Docks.

	Capacity tons.
Kingsbury, bet. Erie and Indiana	60,000
Elston & Division, North Branch	60,000
Halsted and Division Sts., Canal	60,000
North Ave. Bridge, North Branch	40,000
South Halsted St. Bridge, South Branch	60,000

F. W. WHEELER, President. E. T. CARRINGTON, Vice-President. C. W. STIVER, Secy. and Treas.

F. W. WHEELER & CO.,

West Bay City, Mich.

Builders of all kinds of METAL AND WOODEN SHIPS.

AMERICAN CHAIN CABLE WORKS.

ESTABLISHED 1865.

Cable, Dredge, Quarry, Shipping, Crane and Rafting

CHAINS.

Our DREDGE and CRANE CHAINS are made of IRON ROLLED SPECIALLY for that purpose. Send for Price List.

J. B. CARR & CO., Manufacturers, TROY, NEW YORK.

THOS. DREIN & SON, TATNALL AND RAILROAD STS., WILMINGTON, DEL.

Builders of Metallic Life Boats and Rafts, Yachts and Pleasure Boats, Life Preservers. Outfit for Lake Steamers a Specialty.

For Sale

CHEAP for Cash or Chicago Improved Real Estate.

Steamer CHIEF JUSTICE WAITE,

Located at 101st Street and Commercial Avenue,

SOUTH CHICAGO, ILL.

For particulars address, MARINE REVIEW, Cleveland, O.

IRA B. MANSFIELD. Tel. Main 3769. A. E. FINNEY.

MANSFIELD & FINNEY,

Send your Mail in Our Care. Yucatan Cigar Store. Proprietors Marine Laundry.
Telegraph and Messenger Calls in our Store. Vessel Service a Specialty.
173 Jackson Street, CHICAGO, ILL.

PARSONS & PATTISON TRADE A·B·C MARK CHICAGO, ILL.

ALKALI WATER PURIFIER!

A Pure Chemical for the Safe Removal and Prevention of Scale in Steam Boilers. In use by many of the larger steamship lines on the great lakes. Guaranteed.

MANUFACTURED BY

PARSONS & PATTISON CHEMICAL CO.,
1509 Masonic Temple, CHICAGO, ILL.

The L. Noier Et Cie and L. B. & C. PARIS STAR B and Marine Glass.

The L. Noir et Cie and L. B & Co.

U. S. Marine and Signal Glasses have perfect combination and are of extra high power.

Vesselmen and Captains should see these Glasses before purchasing.

Our stock of Barometers, Compasses and Telescopes is complete.

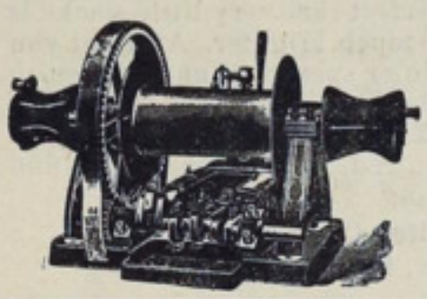
Repairing of all kinds of Nautical instruments a specialty.

L. BLACK & CO., Opticians, 145 Woodward Ave., DETROIT.

Jeffery's Marine Glue

For Paying Seams of Decks and other purposes.

L. W. FERDINAND & CO., Boston, Mass.
Send for Circular.



JACKSON & CHURCH,

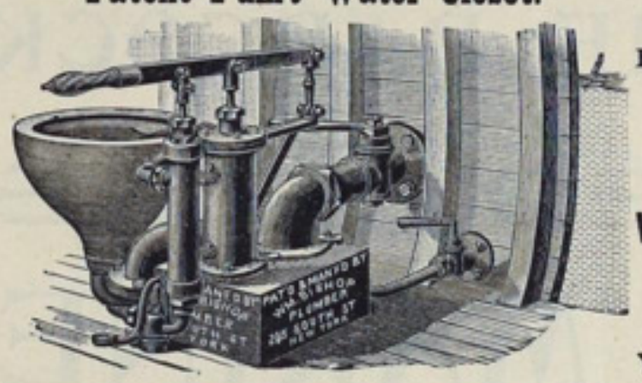
Builders of DUPLEX HOISTING and DECK ENGINES.

Plain Finished and Automatic ENGINES, From Heavy Patterns at Moderate Prices.

Vertical, Horizontal, Marine & Locomotive BOILERS Strictly First-Class and Highest Test.

Send for Circulars and Prices. SAGINAW, MICH.

Patent Pump Water Closet.



For Yachts, Pilot Boats, Naval Ships, Etc.

For above or below water line. In use on U.S. Cruisers New York, Columbia, and Battleships Indiana, Maine, Texas, Massachusetts, Etc. Our No. 4 can be put in a space 15 in. x 15 in.

WILLIAM BISHOP & SON,

205 South St., NEW YORK,
724 Third Ave., BROOKLYN.
Telephone 569 Franklin.
Yacht Fittings a Specialty.

The Martin-Barriss Co.

IMPORTERS AND MANUFACTURERS OF

Mahogany, White Mahogany,

AND ALL NATIVE CABINET WOODS.

HIGH GRADES OF KILN DRIED WOODS FOR CABIN WORK AND INSIDE TRIM.

White Oak Timbers and Plank

CONSTANTLY ON HAND AND SAWED TO ORDER ON SHORT NOTICE.

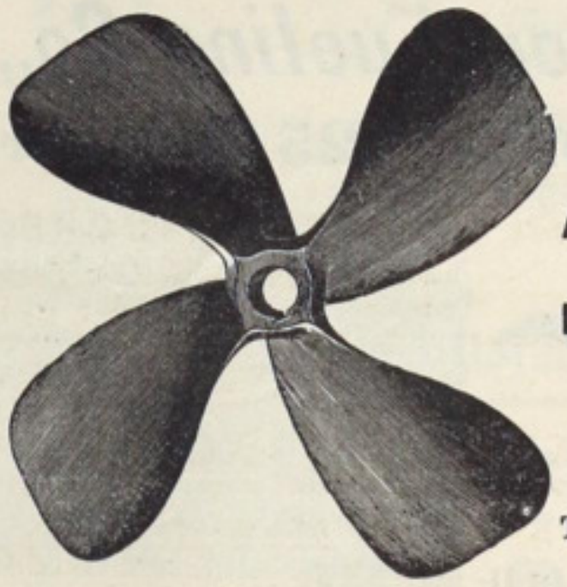
654 Seneca Street, Cleveland, Ohio.

H. G. TROUT,
KING IRON WORKS,

BUFFALO, N. Y.,

MANUFACTURERS OF

TRIPLE EXPANSION, THREE CYLINDER, FORE AND AFT And STEEPLE COMPOUND MARINE ENGINES,



High and Low Pressure Engines, Sectional, Propeller, Tug and Yacht Wheels,

Cowles Aluminum and Manganese Bronze Propeller Wheels.

These Wheels are noted for their extra speed, towing power and proportionate saving of coal.

PRICES QUOTED ON APPLICATION.

DIXON'S Grapite Pipe Joint Grease

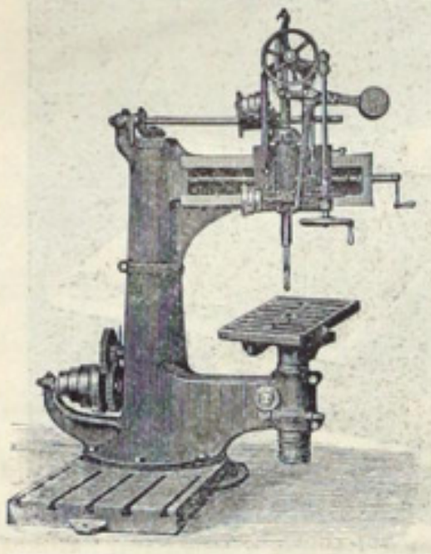
Enables you to MAKE A TIGHTER JOINT than you can possibly make with red lead. You can do it easier, and parts can be separated at any time without breaking anything. Send for sample and circular.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.

DIXON'S Lubricating Graphite

Is fully explained in an INTERESTING AND INSTRUCTIVE PAMPHLET which is FREE to all interested. It will pay a Engineers and Machinists to SEND FOR IT.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.



Bement, Miles & Company,

PHILADELPHIA, PA.

MANUFACTURERS OF

Metal Working Machine Tools

For Ship Yards, Railroad Shops, Locomotive and Car Builders, Machine Shops, Rolling Mills, Steam Forges, Boiler Shops, Bridge Works, etc, etc.

Steam Hammers, Steam and Hydraulic Riveting Machines.

New York Office: Taylor Bldg, No. 39 Cortlandt St. E. H. Mumford, Representative.

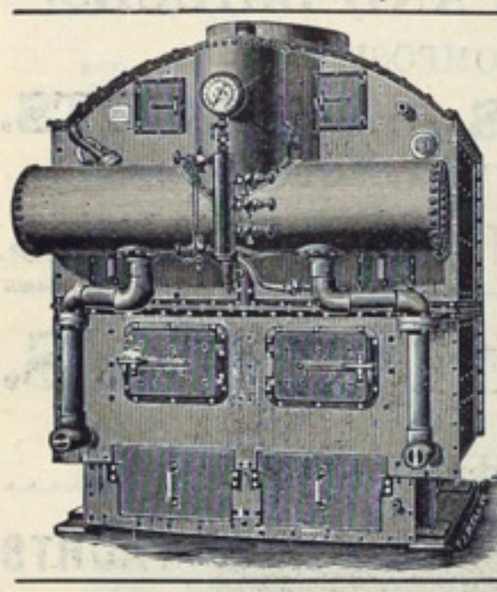
W. & A. FLETCHER CO.

NORTH RIVER IRON WORKS.

Marine Engines, Boilers, &c.

Hudson, 12th and 14th Streets, Hoboken, N. J.

Take Ferry from Foot of West 14th Street, N. Y.



ALMY'S PATENT

SECTIONAL

Water-Tube-Boilers.

NOW USED IN

18 Passenger Boats from 70 to 160 feet long.
27 Steam Yachts from 50 to 160 feet long.
U. S. Torpedo Boat "Stiletto."
Numerous Small Launches and Stationary Boilers are giving most excellent results.

ALMY WATER-TUBE BOILER CO.,

47 CLIFFORD ST.,

PROVIDENCE, R. I.

GEORGE B. CARPENTER. ESTABLISHED 1840. BENJAMIN CARPENTER

GEO. B. CARPENTER & CO.

Ship Chandlers and Sail Makers.

CORDAGE, TWINES, COTTON DUCK, MILL, RAILROAD and VESSEL SUPPLIES.

202, 204, 206, 208 So. WATER STREET, CHICAGO, ILL.

1880. 1893.

CHAS. H. POTTER & CO.,

Investment Bankers,

Cleveland, O.

Dealers in

Lake Superior Iron Mining Stocks,

on about 10 per cent. annual dividend basis, Republic Iron Co., Lake Superior Iron Co., Champion Iron Co., Minnesota Iron Co., Jackson Iron Co., Cleveland-Cliffs Iron Co., Chandler Iron Co., Chicago and Minnesota Ore Co.

C. H. McCUTCHEON,

(Successor to SAMUEL McCUTCHEON.)

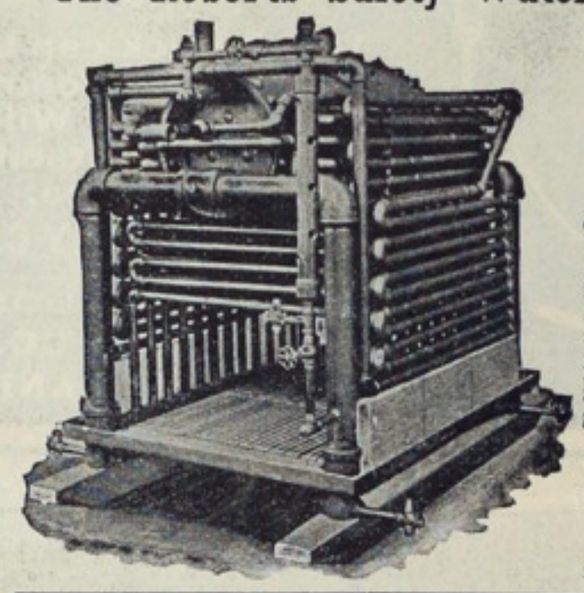
Copper, Tin and Sheet Iron Manufactory,

Steamboat and Engineers' Supplies.

All kinds of Brass Cocks, Globe Valves and Couplings, &c. Iron Pipe and Fittings, and Mill Supplies. Rubber Belting, Hose and Packings, Springs, Valves, &c., Leather Belting and Usudurian Packing.

Telephone No. 68. **No. 18 Ohio Street, BUFFALO, N. Y.**

The Roberts Safety Water Tube Marine Boiler,



For YACHTS, LAUNCHES and other Steamers.

THE ORIGINAL FIXED WATER LINE PIPE BOILER.

"Imitation the Sincerest Flattery."

We are collecting royalties from the customers of many infringers.

NEARLY 600 IN USE.

SAFE, RELIABLE, SIMPLE, LIGHT WEIGHT, ECONOMICAL, NO SHOP REPAIRS, SMALL SPACE. Send for ILLUSTRATED PAMPHLET and other reading matter, with hundreds of enthusiastic letters from purchasers and engineers.

— THE —

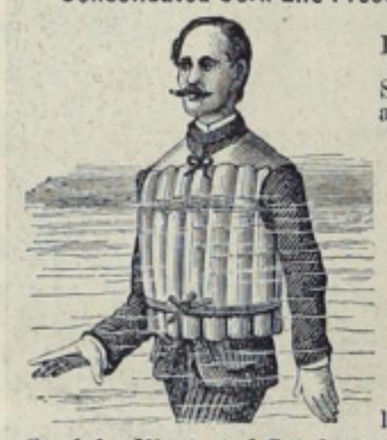
Roberts Safety Water Tube Boiler Co

Works covering 12,000 sq. ft. of ground at RED BANK, N. J.

39 & 41 Cortlandt St., NEW YORK CITY.

NEVERSINK CORK JACKET AND LIFE BELT.

Warranted 24 lb. Buoyancy and full Weight of Cork, as required by U. S. Inspectors. **Consolidated Cork Life Preservers.** Superior to all others. **Ring Buoys and Fenders.**

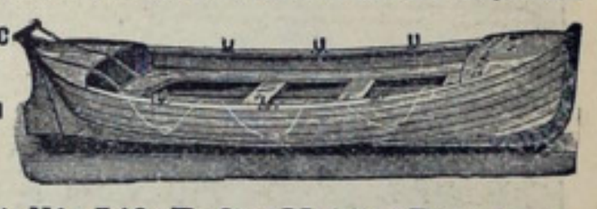


SAFEST. CHEAPEST. Approved and adopted by U. S. Board of Supervising Inspectors.

Also adopted by the principal Ocean, Lake and River Steamer Lines as the only Reliable Life Preserver. Vessels and the trade supplied. Send for catalogue.

Awarded four Medals by World's Columbian Exposition

Metallic and Wooden Life Boats.

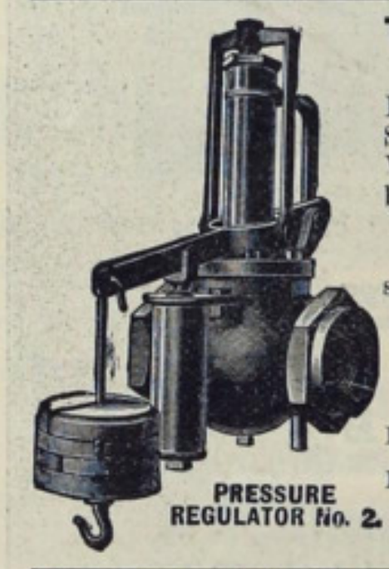


Metallic Life Rafts, Marine Drags.

Manufacturer of Woolsey's Patent Life Buoy, which is the lightest, cheapest and most compact Life Raft known.

Send for Illustrated Catalogue. **D. KAHNWEILER,**

Get our prices before buying elsewhere. 437 Pearl Street, NEW YORK CITY.



PRESSURE REGULATOR No. 2.

The "DAVIS" Pressure Regulator and Reducing Valve.

Is the simplest and best for reducing the pressure to Steam Steering Engines, Donkey Engines, Steam Winches and all places requiring a uniform pressure below that of boilers.

No diaphragms, spring or packing.

Cut shows scale weights. We can furnish lever and sliding ball weight if preferred.

MANUFACTURED BY

G. M. DAVIS & CO.

106 N Clinton St., CHICAGO, ILL.

FOR SALE BY

R. E. Hills, Chicago. C. H. McCutcheon, Buffalo.
Geo. Worthington Co, Cleveland.
P. M. Church, Sault Ste. Marie. Jas. Walker & Son, Detroit.
Jas. Clements & Son, Bay City, Mich
Cleveland Ship Building Co., Cleveland.
Chicago Ship Building Co., Chicago.

Paint your Vessels with **Superior Graphite Paint.**

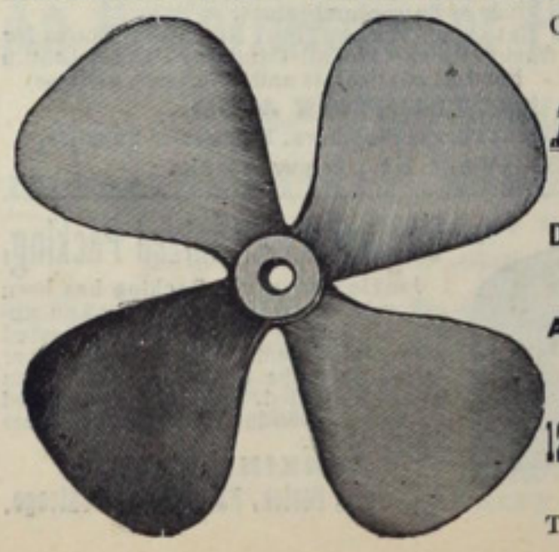
NO BLISTERING, CRACKING OR SCALING.

Made especially for Stacks, Decks, Sides, Hulls and Water Compartments. Strictly anti-rust, and most durable and economical.

DETROIT GRAPHITE MFG. CO., 541 River St., Detroit, Mich.

Whitton & Bates, Agents, 503 Perry-Payne Bldg., Cleveland O.

SHERIFFS MANUFACTURING COMPANY,



C. STARKE, Pres. W. H. MEYER, V. Pres.
THOS. W. SHERIFFS, Manager.

MANUFACTURERS OF

MARINE :: ENGINES,

PROPELLER WHEELS,

Dredge Machinery of Latest Design.

MARINE REPAIRS AT ALL HOURS.

Agents for Marine Trade for BANGS' OIL CUPS.

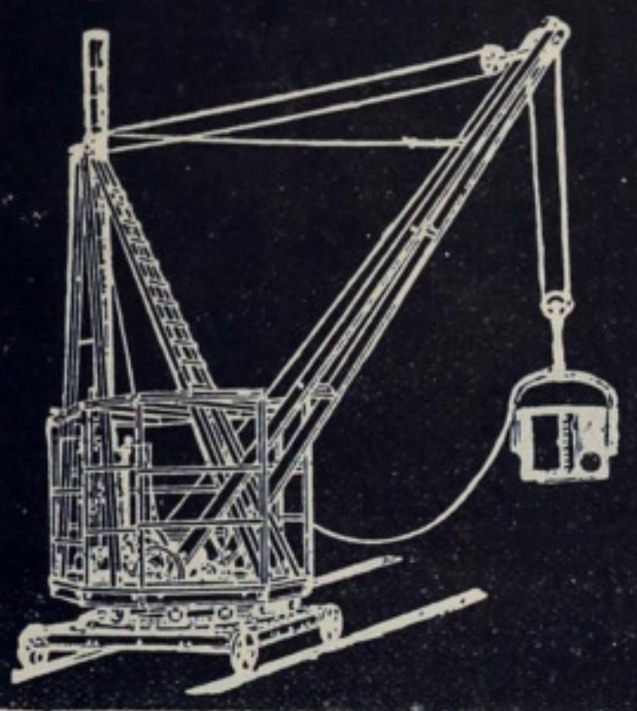
124, 126 128, 130 & 132 Barclay Street, MILWAUKEE, WIS

Telephone 163. Corresponpence Solicited

McMYLER MANUFACTURING CO., 180 COLUMBUS STREET, CLEVELAND, O.

SOLE MAKERS OF THE

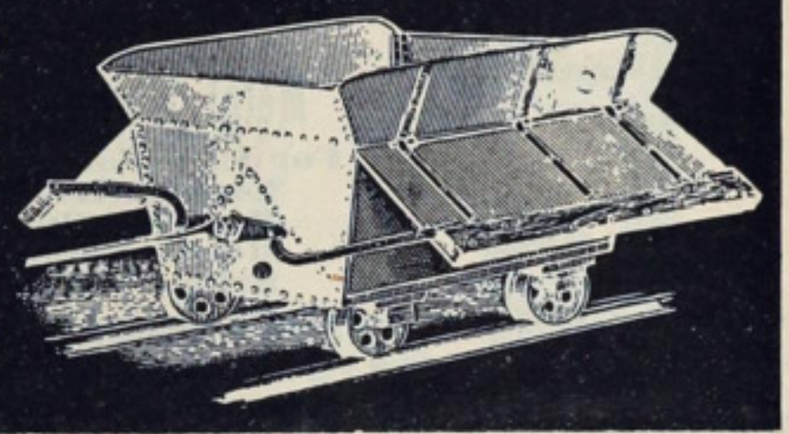
McMYLER PATENT REVOLVING STEAM DERRICK



FOR HANDLING COAL, ORE AND COARSE FREIGHT OF ANY DESCRIPTION.

This Derrick can Lift Load, Alter the Radius of Boom, Swing in Either Direction at Will of Operator, and can Propel Itself on Track any Desired Distance.

BUILT FOR ANY CAPACITY WANTED



BUILDERS OF
CONVEYORS, COAL BUCKETS, ORE BUCKETS AND DUMP CARS.

THE
Swain Wrecking Co.
E. M. PECK, Pres.

4 STEAM PUMPS, 10 JACKS, 3 HAWSERS.

1 COAL and ORE PUMP
3-12 INCH ROTARY
1-14 INCH WORTHINGTON

DIVING RIGS AND DIVERS ABOARD AT ALL TIMES

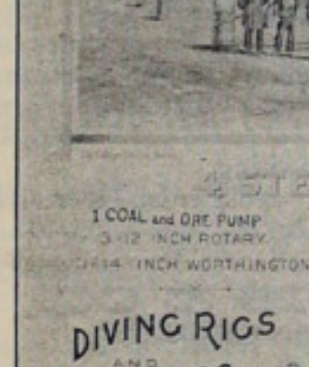
1895			May			1895
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

10-100 TON JACKS
1-12 INCH HAWSER
1-10
1-9

Telegraph
CAPT. M. SWAIN,
CHEBOYGAN, MICH.

TELEGRAPH
PARKER & MILLEN.
DETROIT. MICH.

KATZENSTEIN'S Self-Acting METAL PACKING,



For PISTON RODS, VALVE STEMS, etc., of every description, for Steam Engines, Pumps, etc., etc.

Adopted and in use by the principal Iron Works and Steamship Companies, within the last twelve years, in this and foreign countries.

FLEXIBLE TUBULAR METALLIC PACKING, for slip-joints on Steam Pipes, and for Hydraulic Pressure; also METAL GASKETS for all kinds of flanges and joints.

DOUBLE-ACTING BALANCED WATER-TIGHT BULKHEAD DOORS for Steamers. Also Agents for the McColl-Cumming PATENT LIQUID RUDDER BRAKE. For full particulars and reference, address:

L. KATZENSTEIN & CO.,
General Machinists, Brass Finishers, Engineers' Supplies,
357 West St., New York.

The Original Unvulcanized Packing.

Jenkin's Standard Packing has been severely tested in all positions and under all actions of steam, superheated steam, oils, acids, etc., and has never failed to make a perfect joint when properly applied. See that it is stamped "Jenkin's Standard Packing" and bears Trade Mark.

JENKINS BROS.,
New York, Boston, Philadelphia, Chicago.

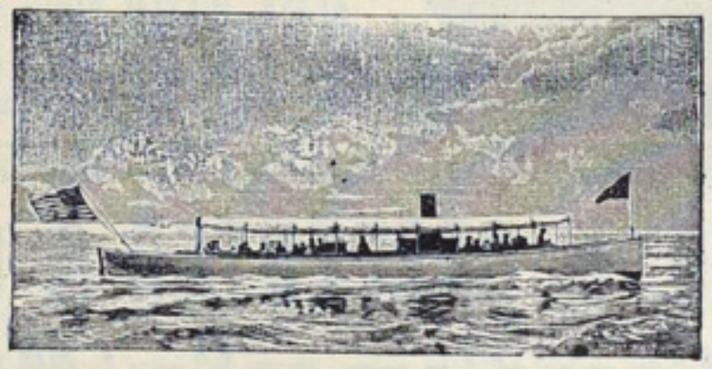
The Bertram Engine Works Co.
(LIMITED.)
ENGINEERS AND SHIP BUILDERS.

MARINE ENGINES AND BOILERS.
STEEL AND COMPOSITE
STEAMERS, TUGS and YACHTS.
ROBERTS AND MOSHER SAFETY WATER-TUBE BOILERS.

Office and Works: Niagara & Bathurst Sts., TORONTO, ONT., Ship Yard: Foot of Bathurst St.

DETROIT BOAT WORKS.

STEEL and WOODEN



YACHTS and LAUNCHES.

BUILDERS OF
ELECTRIC LAUNCHES, DETROIT, MICH.
Any Class Wooden, Iron or Steel Boats up to 150 ft. in length.
YAWLS. METALLIC LIFE BOATS. LIFE RAFTS.
All kinds of Small Pleasure Boats.
The electric launches used on the lagoons at World's Fair were manufactured by this company.
Send for new illustrated Catalogue of electric launches.

SHIP LAMPS.

OIL AND ELECTRIC FIXTURERS
FOR
Steamships, Yachts, &c.
GREAT VARIETY OF DESIGNS.
Prices and Cuts on Application.

PAGE BROS. & CO.,
(FORMERLY WILLIAMS, PAGE & CO.)
227 to 233 Cambridge St., BOSTON, MASS.

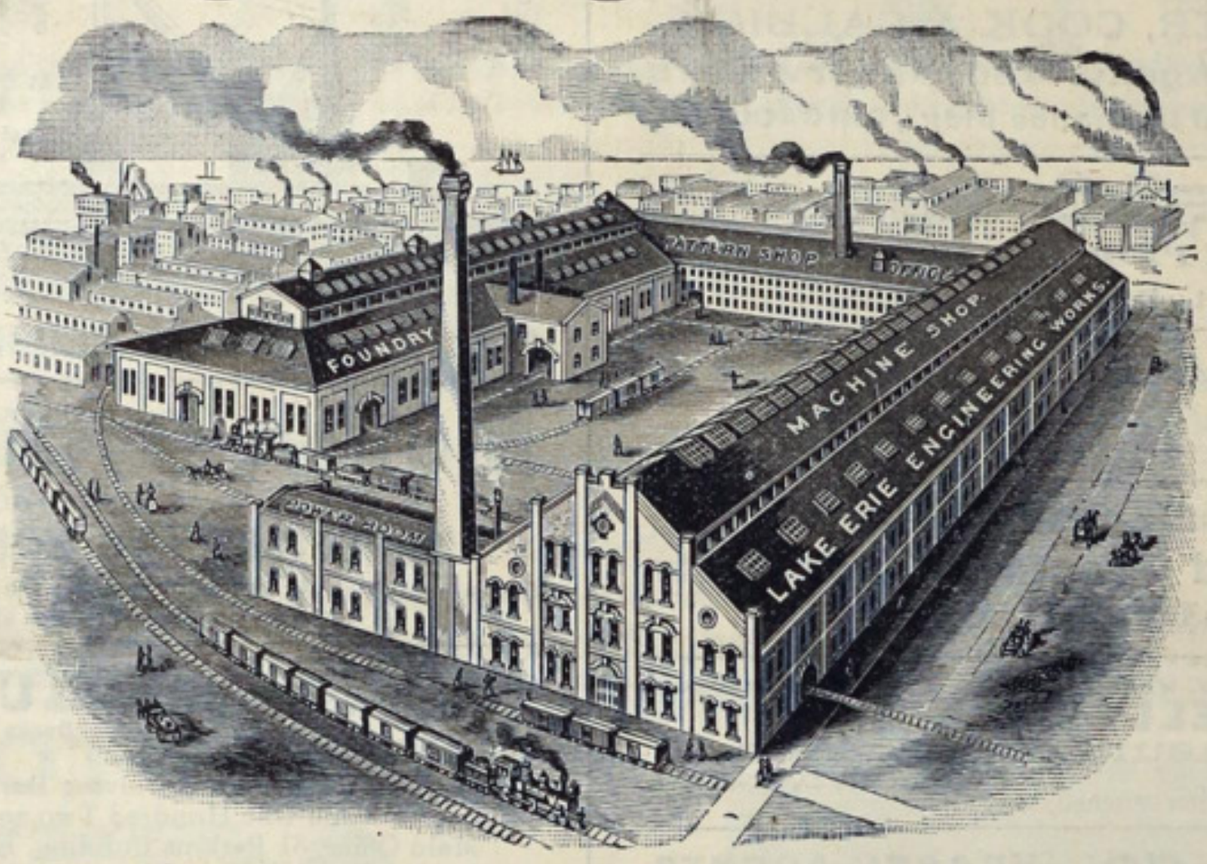
P. M. CHURCH & CO.,
SAVINGS BANK BLOCK, SAULT STE. MARIE, MICH
LEADING DEALERS IN
Ship Chandlery,
Marine Hardware, Paints, Oils, Packings, Cordage, Etc.
FIRST-CLASS COPPERSMITH AND TINSHOP IN CONNECTION.

Lake Erie Engineering Works, Buffalo, N. Y.

RICHARD HAMMOND, Pres't.

JOHN COON, Sec'y and Treas.

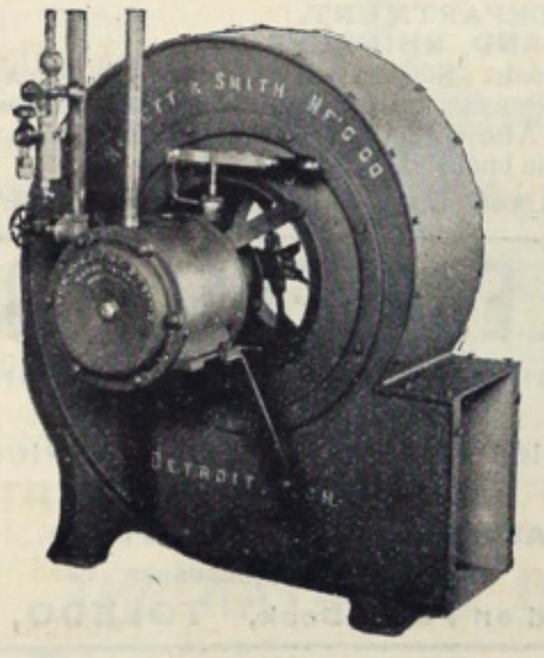
Steam Engines, Compound, Triple and Quadruple Expansion Engines, From 250 to 10,000 Horse Power For Marine and Stationary Service.



Special Designs for Cable Railways and Electric Power Plants.

The Best Economy and Regulation Guaranteed.

THE BEST EQUIPPED PLANT IN AMERICA.



The Smith Blower and Engine.

SHIP AHOY!

AHA, AHA, SIR! WHAT IS IT?

THE BEST

MARINE WATER TUBE BOILERS,

For Steam Yachts, Etc. and

COMBINED BLOWER and ENGINE.

For Forced Draught and Venti'ation

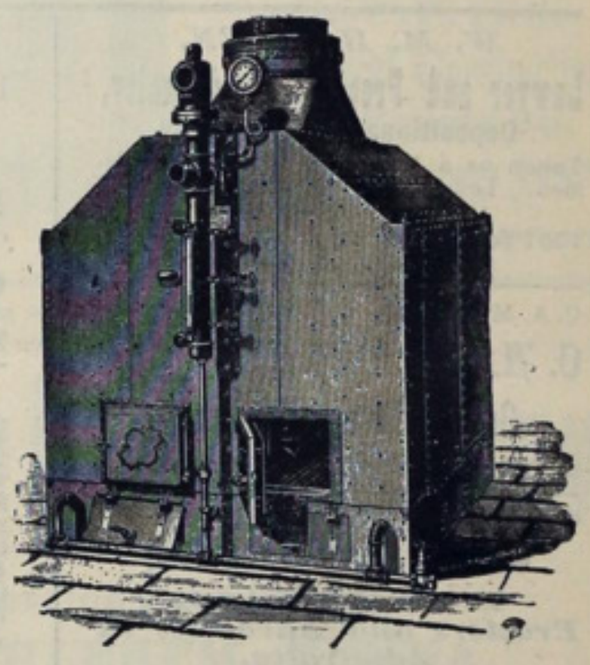
ARE MANUFACTURED BY

The Huyett & Smith Manufacturing Company,

Detroit, Mich.

Makers of the largest line of Fans and Blowers in the United States.

(Write for Catalogue, References, Etc.)

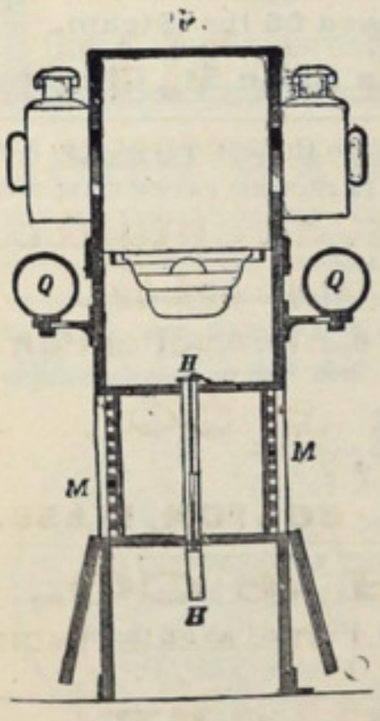


The Smith Marine Water Tube Boiler

PATENT ADJUSTABLE

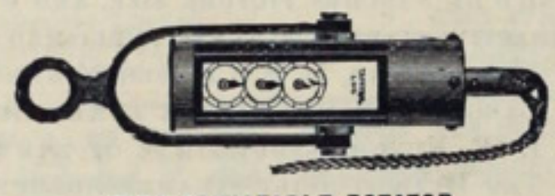
BINNACLE and COMPASS

FOR PILOT HOUSES.



With Directions for Adjustment.
SEND FOR CIRCULAR.

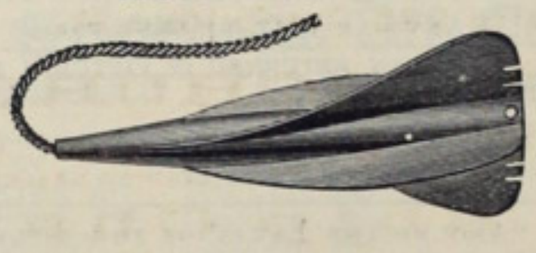
..TAFFRAIL LOG..



WITH ADJUSTABLE ROTATOR.

BEST LOG IN THE MARKET.

THOUSANDS IN USE.



MANUFACTURED BY

JOHN BLISS & CO., 128 Front Street, NEW YORK.

The Chase Machine Co.

111 ELM ST., CLEVELAND, O.

...MACHINISTS AND ENGINEERS...

MANUFACTURERS OF

LAND AND MARINE ENGINES and STEAM PUMPS,

SOLE OWNERS AND MANUFACTURERS OF

Chase Fog Whistle Machine.

Over 150 in use on the best class of Lake Steamers.

Special Attention given to Marine Repair Work.

ENGINEERS' SUPPLIES.

ASBESTOS PIPE AND BOIER COVERING. TELEPHONE 994.

An Opportunity for ENGINEERS!

Two Indicators for Sale Cheap.

THOMPSON LATEST IMPROVED, with six extra springs —warranted good as new—used only a few times— It is worth $115—our price $70.

Calkins Steam Engine Indicator, Planimeter, Pantograph extra springs, and three way cock—full outfit for taking indicator cards — regular price $40 — our price $35.

MARINE REVIEW,
516 Perry-Payne Bldg., Cleveland, O.

HARVEY D. GOULDER,
LAWYER AND PROCTOR IN ADMIRALTY.
CLEVELAND, O.

C. F. PALMER.
CAPT. J. A. CALBICK.
W. H. COOK.
PALMER, COOK & CALBICK,
Vessel Agents and Underwriters.
Tel. Harrison 689. 108 & 109 Royal Insurance Bldg., CHICAGO, ILL.

H. R. SPENCER,
ATTORNEY AT LAW and PROCTOR IN ADMIRALTY.
218 Superior St., DULUTH, MINN.

C. E. KREMER, *Attorney and Counselor-at-Law and Proctorin Admiralty.*
Rooms 14, 15 and 16, Bryan Block, - - 164 LA SALLE ST., CHICAGO, ILL.

HARVEY L. BROWN,
Attorney at Law and Proctor in Admiralty,
Buffalo, N. Y.

JOHN MITCHELL. JOHN F. WEDOW. ALFRED MITCHELL.
MITCHELL & CO.,
Vessel and Insurance Agents,
508, 509 and 510 Perry-Payne Building, CLEVELAND, OHIO
Office Telephone, 737. Reidence, John Mitchell, 3506.

C. R. JONES & CO., VESSEL AGENTS,
FIRE AND MARINE INSURANCE.
Nos. 501, 502 and 503 Perry-Payne Bldg., CLEVELAND, O.

W. M. HAYDEN,
Lawyer and Proctor in Admiralty,
Depositions and Testimony
Taken as a Notary or under a commission. Legal business and collections promptly attended to.
1007 Soc. for Sav. Bldg., CLEVELAND, O.
Telephone 2297.

C. A. Macdonald. J. J. Rardon.
C. A. MACDONALD & CO.
General Insurance Agents,
RIALTO BUILDING, CHICAGO, ILL

H. S. LORD. J. H. NORTON.
LORD & NORTON,
Attorneys-at-Law, Proctors and Advocates in Admiralty,
DULUTH, MINN.

White, Johnson & McCaslin,
ATTORNEYS-AT-LAW,
—AND—
Proctors in Admiralty,
26-27 Blackstone Building,
CLEVELAND, - OHIO.

THOS. WILSON,
MANAGING OWNER
WILSON'S TRANSIT LINE.
Gen. Forwarder.
Freight and Vessel Agent.
CLEVELAND, O.

C. F. Palmer. C. L. Hutchinson.
PALMER & CO.,
Vessel Agents and Underwriters,
515 Perry-Payne Bldg., Cleveland, Ohio.
Telephone 644.

W. A. HAWGOOD. C. C. CANFIELD.
HAWGOOD & CANFIELD,
Vessel Agents and Marine Insurance,
604-605 Perry-Payne Bldg.,
Cleveland, - Ohio.
Telephone No. 2395.

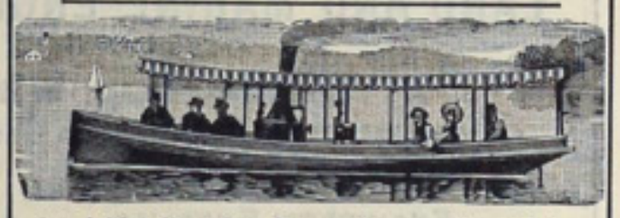
ORESTES C. PINNEY,
Lawyer and Proctor in Admiralty.
Rooms 722 and 723 Perry-Payne Bldg.
CLEVELAND, OHIO.
Telephone 2585.

C. W. ELPHICKE. JAS. A. MYERS.
A. L. FITCH.
C. W. ELPHICKE & CO.
GENERAL INSURANCE AGENTS.
Room 10, No. 6 Sherman St., Chicago, Ill.

H. J. WEBB & CO.
SHIP BROKERS, VESSEL OWNERS and AGENTS,
Established in 1856. H. J. Webb & Co. will charter vessels for the lake trade. Special attention given to chartering vessels in the Lake Superior Iron Ore trade, both for the season and single trip.
No. 606 & 607 Perry-Payne Building, Cleveland, O. Office Telephone No. 338, Residence No 3228.

J. T. ROSE. FRANK B. LAZIER.
ROSE & LAZIER,
Vessel Agents and Brokers, and Marine Insurance,
16 Board of Trade,
DULUTH, - - MINN.

Capt. LYMAN HUNT. JAMES P. HUNT.
L. HUNT & SON,
Vessel Brokerage & Marine Insurance,
Room 9, Exchange Building.
Telephone No. 522.
No. 202 Main St., BUFFALO, N.Y.



Send 10c. for a handsome 64 page illus. Catalogue of Boats, Yachts, Canoes, Launches, etc., to G. D. FELLOWS, Racine, Wis.

PATENTS
Promptly secured. Trade-Marks, Copyrights and Labels registered. Twenty-five years experience. We report whether patent can be secured or not, free of charge. Our fee not due until patent is allowed. 32 page Book Free.
H. B. WILLSON & CO., Attorneys at Law, Opp. U. S. Pat. Office. WASHINGTON, D.C.

H. A. BARR, PRESIDENT, Escanaba. F. H. VAN CLEVE, SEC. Escanaba. CAPT. GEO. BARTLEY, SUPT. Escanaba.
ESCANABA TOWING & WRECKING CO., Escanaba, Mich.
Tugs, Lighters, Steam Pumps, Hawsers, Hydraulic Jacks and Diving Appliances always ready.
TUG MONARCH, Engine Compound, Cylinder 16 and 30 inches diameter, 30 inch-Stroke, Steam Pressure Allowed, 125 pounds.
TUG DELTA, Cylinder 20 by 22, Steam Pressure Allowed, 105 pounds.
TUG OWEN, Cylinder 20 by 20, Steam Pressure Allowed, 104 pounds.
CENTRIFUGAL PUMPS, Seven and Fourteen Inch Suction

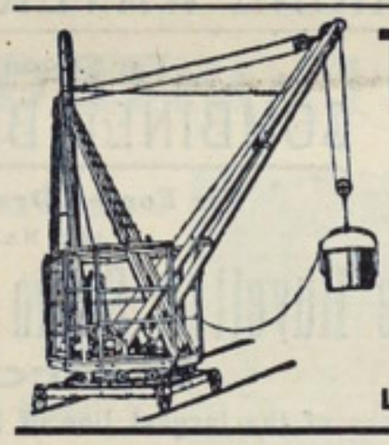
Pickands, Mather & Co.,

FUEL LIGHTERS AT BUFFALO, ERIE, ASHTABULA AND CLEVELAND.
At DETOUR, MICH., A FUEL DOCK equipped with Shute capacity of 600 Tons.
Best Quality PITTSBURGH COAL furnished at any time during Day or Night.
Western Reserve Building, CLEVELAND, O.

Mullen-Gatfield Coal Co.
— DEALERS IN THE CELEBRATED —
MANSFIELD AND YOUGHIOGHENY COALS.
Docks at SANDWICH, ONTARIO, opposite the Fort at Detroit, with chutes for rapid fueling.
Elevated docks and derrick at AMHERSTBURG, ONTARIO.

THE CUDDY-MULLEN COAL CO.
Dealers in COAL.
Docks at Government Pier, Whiskey Island, and Adjoining Globe Dry Dock.
All fully equipped with Revolving Derricks; also, Lighter Carrying Derrick and One Hundred Two and One-Half Ton Buckets.
Main Office, 81 Perkins Building, East Side of Main Street Bridge.
Dock Office, 127 West River St., Cleveland, O. Telephone No. 8.
Boats Coaled Day and Night. Docks at Amherstburg,

Ohio & Pennsylvania Coal Co.
FUEL DEPARTMENT.
MINERS AND SHIPPERS,
Youghiogheny and Ohio Steam Coals. Steamboats, Tugs, etc., Coaled day or night, DOCKS FOOT WEST RIVER STREET. WHISKEY ISLAND GOVERNMENT PIER and C. & P. R. R. SLIPS. Also STEAM LIGHTER—Equipped with Revolving Derrick and (100) two ton buckets.
Telephone 1608. Office, 130 West River St., CLEVELAND, OHIO.



TOLEDO FUEL CO.,
Cambridge, Hocking, Jackson and Massilon Coal
Wheeled on or put on with DERRICK.
NIGHT OR DAY.
SATISFACTION GUARANTEED.
H. H. WILLIAMS, Manager.
Located on Penn. Dock, TOLEDO, O.

Marine Engineering
(*Also Stationary and Locomotive*); *Mechanics; Mechanical Drawing; Electricity; Architecture; Iron Work; Railroad, Bridge and* Municipal Engineering; Plumbing; Heating; Mining; Prospecting; English Branches. CANDIDATES PREPARED TO OBTAIN LICENSES. Courses begin with Arithmetic. Send for Free Circular, stating subject you wish to study.
The International Correspondence Schools, Scranton, Pa.

TAUGHT BY MAIL THOROUGH PRACTICAL

For Sale TUG in First-Class Shape.
Engine 18x22, Good Boiler, Allowed 95 lbs. Steam.
Condit & Hussey, Room 59, 159 La Salle St, Chicago.

MARINE ART VIEWS: SIX HANDSOME PHOTO-CHROMOTYPES, OF 5 BY 8 AND 6 BY 9 INCHES PICTURE SIZE, AND 9 BY 12 INCHES PAPER SIZE; MOST ATTRACTIVE MARINE PICTURES PUBLISHED—
NIGHT SCENE, U. S. CRUISER MINNEAPOLIS,
LARGEST STEAMER ON THE LAKES, ZENITH CITY,
I. W. NICHOLAS, DUPLICATE OF THE CHILI,
TEN DETROIT-BUILT STEAMERS. GROUPED,
THE NORTH LAND—EVENING SCENE,
THE W. H. GRATWICK—HEAVY WEATHER COMING.
THE SIX WILL BE SENT IN A TUBE FOR $1;
ANY ONE WILL BE SENT FOR 25 CENTS;
MONEY RETURNED IF PICTURES ARE NOT SATISFACTORY.
MARINE REVIEW,
516 PERRY-PAYNE BLDG.,
CLEVELAND, O.

"AROUND THE LAKES" IS THE TITLE OF A BOOK CONTAINING A LIST OF ALL LAKE VESSELS WITH POST OFFICE ADDRESS OF MANAGING OWNERS. ILLUSTRATIONS ALL HIGH-CLASS PHOTO-ENGRAVINGS. SOLD BY THE MARINE REVIEW AT $2.

S. F. HODGE & CO.

MARINE ENGINES,
PROPELLER WHEELS,
DECK HOISTERS,
MARINE REPAIRS.

320 ATWATER STREET,
DETROIT, MICH.

BAR IRON

THE CONDIT FULLER CO.

CLEVELAND, O.

BOILER RIVETS, BOILER TUBES, IRON PIPE,
BOAT SPIKES,
CLINCH RINGS, &c.

HIGH GRADE MATERIALS FOR VESSEL CONSTRUCTION A SPECIALTY.

PIG IRON

SALES AGENTS:
THE CARBON STEEL CO.
MANUFACTURERS OF
ACID OPEN HEARTH STEEL
SHIP, BOILER, BRIDGE AND TANK PLATES, &c., &c.

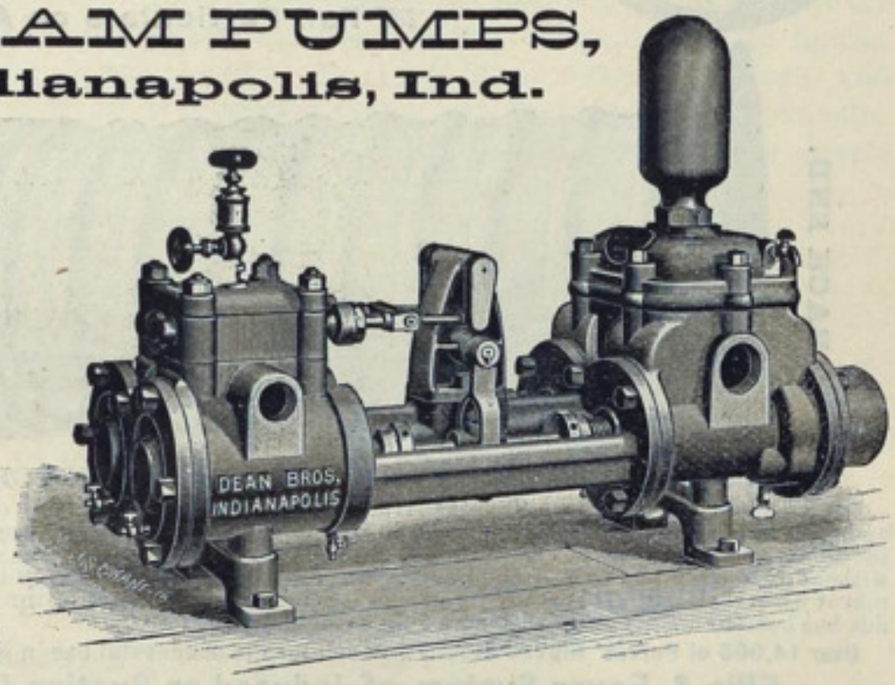
SALES AGENTS:
THE CAMBRIA IRON CO.
MANUFACTURERS OF
ACID OPEN HEARTH
AND BESSEMER STEEL
ANGLES, BARS, CHANNELS, BEAMS, TEES, ZS, &c.

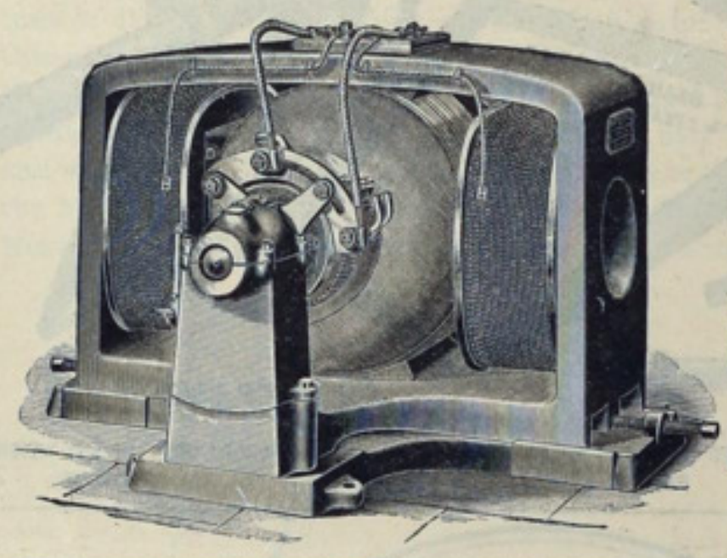
DEAN BROTHERS,

STEAM PUMPS,
Indianapolis, Ind.

Boiler Feeders, Air Pumps and Condensers, Ballast Pumps, Fire Pumps, Bilge Pumps.

SEND FOR CATALOGUE

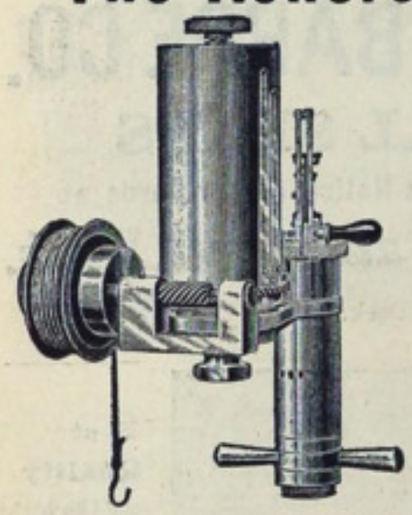




Electrical Supplies
—FOR—
..STEAMSHIPS..
A SPECIALTY.

The F. P. Little
Electrical Construction
and Supply Co.
No. 135 E. Seneca Street,
BUFFALO, N. Y.
Send for Catalogue

The Ashcroft Manufacturing Co.



SOLE MANUFACTURERS OF
The Tabor Steam Engine Indicator
FITTED WITH
HOUGHTALING REDUCING MOTION.

The most Complete, Compact, and Reliable Indicator Outfit, for indicating high or slow speed engines, now made. This instrument received at "The World's Columbian Exposition" the

HIGHEST AWARD

for Excellence of Design, Superior Grade of Workmanship and Finish, Reliability and Efficiency.
SEND FOR SPECIAL PAMPHLET.

Office and Salesroom, 111 Liberty St., NEW YORK.

—THE—
Bethlehem Iron Company

PRINCIPAL OFFICE and WORKS:
SOUTH BETHLEHEM, PENNA.

Steel Rails, Open Hearth, Bessemer and Nickel Steel Billets and Forgings.

Hydraulic Forged Shafting, Hollow or Solid.
Cranks, Rolls, Etc.

Rough Machined or Finished. Fluid Compressed Steel.

GUNS and ARMOR.

New York Office,
80 Broadway.

Philadelphia Office,
421 Chestnut St.

Western Agents, FISHER & PORTER,
1025 Monadnock Building, - Chicago, Ills.

JOHN HAUG,

Consulting Engineer and Naval Architect.

Ship and Engineer Surveyor Lloyds Register, London.
Plans, Specifications and Superintendence of Ships and their Machinery.
Specialties—Bulk Oil Vessels High Speed Yacht Engines, etc.

206 Walnut Place, Philadelphia.

MARINE VALVE OIL
FOR INTERNAL LUBRICATION.

RENOWN ENGINE OIL
FOR EXTERNAL LUBRICATION.

Marine Valve, Renown Engine, Eldorado Engine, Crank Case, Victor Signal, Dark Lubricating, Mineral Seal, Head Light, Artic Cup Greases, and Lard Oils.

— CARRIED IN STOCK AT THE —

STANDARD OIL COMPANY'S MARINE DEPOT,

TELEPHONE 77. 123 River Street, CLEVELAND, O. MAIN OFFICE TELEPHONE 682.

ALSO FOR SALE BY STANDARD OIL COMPANY,
Chicago, Ill., No. 5 Wabash Ave.
Racine, Wis.
Milwaukee, Wis., Broadway & Mason.
Sheboygan, Wis.
Manitowoc, Wis.
Green Bay, Wis.
Marinette, Wis.
Oshkosh, Wis,
Duluth, Minn,
West Superior, Wis.
Hancock, Mich.
Marquette, Mich.
Buffalo, N. Y.
Sault Ste. Marie, Mich.
West Bay City, Mich., M.C.Ry. & 10th St
Saginaw, Mich., Eighth & Sears Sts.
Detroit, Mich., 46 Jefferson.
Toledo, O., Summit & Monroe Sts.

ATLANTIC REFINING COMPANY, French & 16th Sts., Erie, Pa.
D. ROBESON, Port Huron, Mich.
W. S. MCKINNON, Ashtabula Harbor, O.
HULL & RAND, Huron, O.
EDWARD BRAMMALL, Benton Harbor, Mich.
BABY & DALE, St. Clair, Mich.
N. C. ALTEN, Lorain, O.
A. F. HARRINGTON, Conneaut Harbor, O.
A. H. MCGONAGIL, South Chicago, Ill.
MARINE SUPPLY CO., Fairport, O.
F. KRANZ, Sandusky, O.
THE M. I. WILCOX CORDAGE & SUPPLY CO., Toledo, O

COMPLETE ✻ ELECTRICAL ✻ INSTALLATIONS

For Steamships, Whalebacks, Yachts, Docks, Wharves, Etc.

DYNAMOS, WIRING APPLIANCES, WIRES, LAMPS, SEARCHLIGHTS, HOISTS, ETC., All of the Latest and Most Perfect Type.

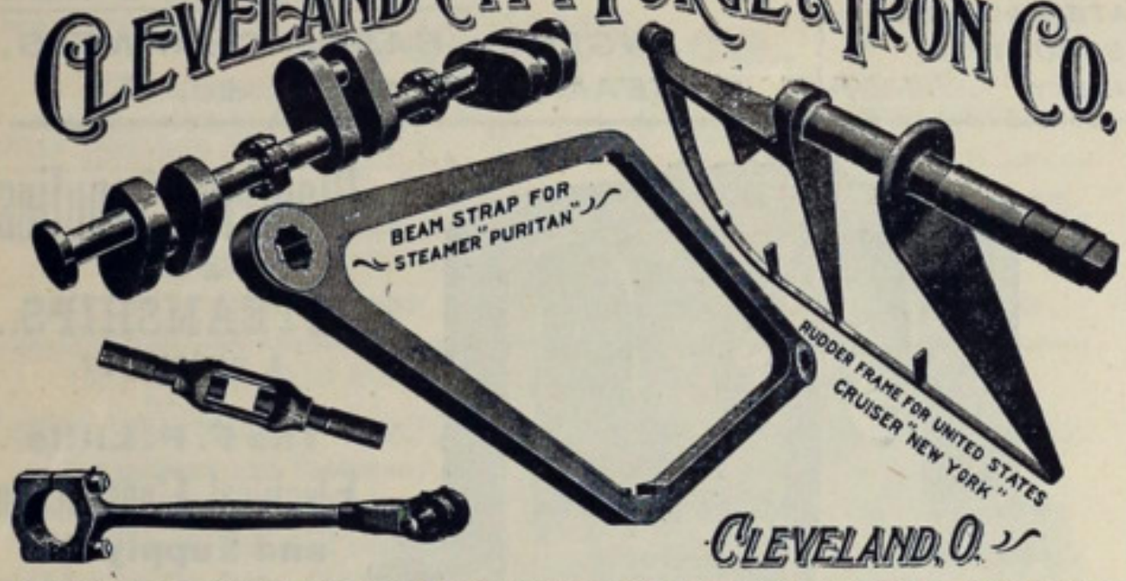
GENERAL ELECTRIC COMPANY.

SALES OFFICES: { Schenectady, N. Y. Boston, Mass. Chicago, Ill. Philadelphia, Pa. Detroit, Mich. Baltimore, Md. Buffalo, N. Y. Portland, Ore. Columbus, O. San Francisco, Cal. New York, N. Y

FRONTIER IRON WORKS

MARINE ENGINES, DETROIT, MICH

CLEVELAND CITY FORGE & IRON CO.



CLEVELAND, O.

IRON OR STEEL FORGINGS FINISHED COMPLETE, ROUGH MACHINED OR SMOOTH FORGED ONLY, OF ANY WEIGHT.
COUPLING LINKS AND PINS. PRESSED WROUGHT IRON TURNBUCKLES. CAR IRON SPECIALTIES.

COAL

STANLEY B SMITH & CO.

OPERATING SMITH'S COAL DOCK, POCKET FUELING AND LOW DOCK, DETROIT, MICH.

OFFICES: DETROIT MICH.

OPERATING LORAIN COAL DOCK, LORAIN, OHIO. LAKE SHIPPERS OF STEAM COAL.

STEAMBOAT FUELING

COAL

THE GEO. F. BLAKE MFG. CO.

BUILDERS OF

MARINE PUMPS

Single and Duplex Pumps for Boiler Feed, Fire or Bilge Service—Vertical and Horizontal.

Vertical and Horizontal Pumps, Air Pumps for Surface and Jet Condensers.

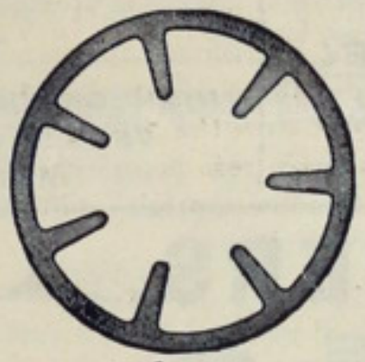
AIR PUMP ON U.S. CRUISER NEW YORK.

95 and 97 Liberty St., NEW YORK.

HOWARD H. BAKER & CO.

Ship Chandlers and Sail Makers,

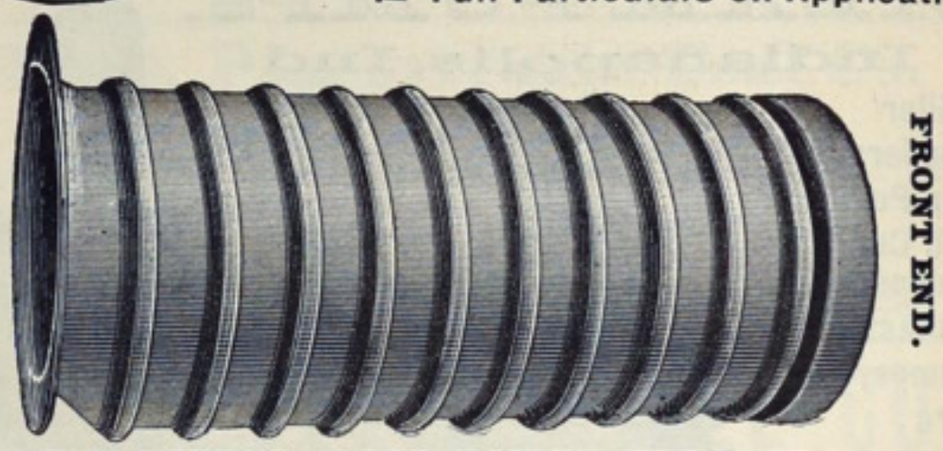
18 to 26 Terrace. BUFFALO, N.Y.



Serve's Steel Ribbed Boiler and Stay Tubes

Show an average economy in fuel of 15 per cent. In steamers this means not only so much saving in cost of coal or increased power, but additional freight capacity.

☞ Full Particulars on Application.



PURVES' RIBBED STEEL BOILER FURNACE FLUE.

With this style of Furnace Flue the rivets at the "back ends" are out of the line of fire, and all that has to be done to remove it is to cut out the rivets at the ends and slip it through the front; and to replace it, simply to slip it back in its place and rivet up the ends again without disturbing any part of the boiler. No smithwork is required to fit it on a boiler or to refit it when replaced. It is ready for use as it comes from the manufacturers. This style of flue has been in use six years without a single complaint.

Over 14,000 of Purves' Ribbed Steel Furnace Flues in successful use in Marine Boilers.

Ellis & Eaves System of Induced or Suction Draft.

CHARLES W. WHITNEY, Sole Agent for the United States and Canada. 64, 66, 68 BROADWAY NEW YORK

AMERICAN STEEL BARGE CO.

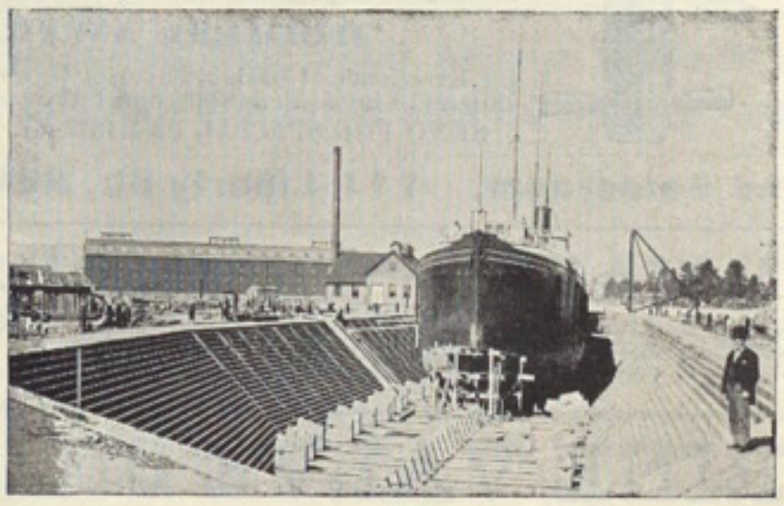
STEEL and METAL SHIPS

Of all classss built on the Shortest Possible Notice at our yards at

West Superior, Wis., and also at Everett, Wash.

Photograph of 300 ft. Boat in Dock.

Plates & Material Always on hand to Repair all kinds of Metal Ships in Shortest Time.



Best Quality of Oak instock for Repairing Wooden Vessels of all Classes.

SIZE OF DOCK.

Length, extreme	537 feet.	Entrance, Top	55 feet 9 in.
Breadth, Top	90 " 4 in.	Entrance, Bottom	50 "
Breadth, Bottom	52 "	Depth over Sills	18 "

LARGEST DRY DOCK ON THE LAKES.

Prices for Repairs and Docking same as at lower lake ports

SUPERIOR, WIS.

A number of Propellor Wheels in stock at Dry Dock.

"ROPER'S LAND AND MARINE ENGINES," BOUND IN MOROCCO WITH FLAP AND POCKET, WILL BE MAILED TO ANY ADDRESS FOR $3.50 SENT TO THE MARINE REVIEW, CLEVELAND, O.